DESIGN ISSUES AND DECISIONS IN IMPLEMENTING CALL LABS IN TERTIARY LEVEL INSTITUTIONS

A THESIS PRESENTED BY
ELİF TOKDEMİR
TO THE INSTITUTE OF ECONOMICS AND SOCIAL SCIENCES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF ARTS
IN TEACHING ENGLISH AS A FOREIGN LANGUAGE

BİLKENT UNIVERSITY
AUGUST 1997

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ABSTRACT

Title:	Design Issues and Design Decisions in Implementing CALL Labs in Tertiary Level Institutions
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Since the introduction of computers into language teaching in the late 1960s, there have been many developments in CALL applications and techniques. There have been arguments for and against the use of computers as an aid to language teaching since the first applications of CALL. There appears to be one point on which all researchers on CALL agree: The most important concern in using computers in language teaching is that the critical design issues should be well defined and decisions within each design issue should be taken according to the needs of the users and the goals of the institution.

Starting from the 1990s, Turkish Higher Education institutions have been involved in CALL. Though limited, a number of institutions, mostly private ones, have established CALL labs as an aid to language teaching. Since CALL applications are expensive and local experience is limited, research on how to make most effective use of CALL labs is critical. Research on CALL in Turkey has focused to this point on the design of educational software. Research is now needed on implementation issues of CALL in Turkey.

This research study focused on the critical design issues to be considered when establishing a CALL lab in order to assist academic decision makers in Turkey. The particular

audience is the administrators of the Preparatory School of English for Post Graduate Students, Karadeniz Technical University.

The study aimed at answering a number of research questions regarding critical design issues in respect to the establishment of a CALL lab. The first question was to determine the design issues themselves. The second question was to determine how various national and international CALL labs dealt with the design decisions and how users have reacted to these design decisions.

Students' reactions were examined by means of a student questionnaire focusing on the design characteristics of CALL labs. A total of seventy five intermediate and upper intermediate level students from Koç University and Bilkent University were given questionnaires.

Interviews with Turkish and foreign administrators of CALL labs and CALL lab staff were done to examine how design decisions were made in various institutions. In Turkey Bilkent University, Baþkent University, Koç University and the Turkish Military Academy were chosen as representative samples. Three administrators and five CALL lab staff were interviewed.

International sampling was done through interviews done by means of e-mail correspondence. The foreign samples were Oregon State University, Michigan State University and University at Albany, State University of NewYork.

Design issues found critical in CALL were determined to be choosing staff, training teachers, staff and students, scheduling for use, finding adequate budget, selecting equipment, establishing links with users, maintenance and obtaining appropriate space and location. It was found that administrators and students agreed on the necessity of having a CALL lab in a language teaching institution. It was also found that certain design decisions such as the

selection of software, directly effect the attitudes of students towards the CALL lab. In their task of designing their lab decision makers should pay equal attention to all the design issues in order to establish a highly used CALL lab.

BILKENT UNIVERSITY

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MA THESIS EXAMINATION RESULT FORM

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The examining committee appointed
by the Institute of Economics and Social Sciences for the
thesis examination of the MA TEFL student

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The committee has decided that the thesis
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We certify that we have read this thesis and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts.

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To the memory of my dear brother

Armağan Tokdemir.

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CHAPTER 1 INTRODUCTION

Introduction

In its early years the computer was a large expensive machine which was used by industrial corporations, government and the military (Higgins & Jones, 1984). The computer started to be considered as an educational medium in the 1940s and in the 1960s CAI (Computer Assisted Instruction) began to emerge as a recognized discipline (Jung, 1991).

Since the introduction of computers into the language teaching profession, both the computer and its uses in language teaching have evolved greatly. Unlike previous technological aids, the computer provided an interactive and exploratory learning environment, could respond to learners and allow for learner creativity in both language learning and other areas (Underwood, 1984, p.41). Today there is a wide use of the computer and its capacities in language teaching. As the most current technological aid, the computer has some advantages over the past uses of technology. CALL (Computer Assisted Language Learning) has the advantage of making use of past experiences with technology. These experiences have shown that making large investments in technological devices designed for education is not enough to get the desired result from them. The design and planning are the key elements for the successful implementation of technology in language teaching. The language laboratory experience of the 1960s and 1970s is a recent example of how bad application of technological aids to language learning can result in failure

(Underwood, 1984). It is through careful design and planning that a CALL lab can provide the maximum help to language teaching.

With this study, ways of designing a modern successful CALL lab will be sought. A variety of CALL lab design models from national and international institutions will be provided for decision makers by surveying the decisions made with respect to CALL lab design issues. The problems faced in previous experiences with CALL labs in both Turkey and abroad will be a guide to decide on the importance of each design issue. Design issues are factors which are critical in designing a CALL lab. These critical design issues can be listed as follows: decision making for the CALL lab, finding adequate budget, deciding uses of the CALL lab, training teachers, staff and students, selecting equipment (hardware and software) and maintenance. Every institution makes different decisions in dealing with these design issues, these decisions are referred to as design decisions in the study.

Since the 1980s microcomputers which are comparatively inexpensive have made it possible for both individuals and schools to purchase computers. Thus the computer has started to be used by a wider range of people and institutions with a wider range of functions.

For many years the computer was used by foreign language teachers to provide supplemental exercises in the instruction of foreign languages. In recent years, advances in computer technology have motivated some educators to reassess the computer and consider it a valuable part of daily foreign language learning(Higgins, 1993). Innovative software programs, authoring capabilities, compact disc technology, and elaborate computer networks are providing teachers

with new methods of incorporating culture, grammar and real language use in the classroom while the students gain access to audio, visual and textual information about the language and the culture of its speakers (Higgins, 1993).

In the 1990s the most apparent change in CALL design is the wide usage of computer capacities not designed for language instruction. Today's CALL has gone beyond using only software designed for language instruction. There is a growing use of e-mail to support authentic language-in-use exchanges between learners and between learners and native speakers. Word-processing programs are being used for writing; concordances and thesaurus programs are used in the teaching of vocabulary and word use; the World Wide Web is being used as a language sample/cultural awareness tool and computers are used to orchestrate multi-media instruction.

Background to the Study

The trend of development and change has taken CALL labs from a phase of students in rows working alone and in silence at mechanical drills, when the majority of teachers held the idea that computers like the previous language labs had nothing to do with communicative language teaching (Fortescue; Jones, 1987), to a phase of today's networked multimedia CALL labs with access to e-mail and the World Wide Web.

This study will aim at defining the current state of concern for design issues in both international and national CALL labs in order to provide a variety of design

models for Turkish language teaching institutions. This variety of models will provide the input for future decision making of CALL labs in Turkey.

In the study the concern for design issues of these institutions will be surveyed in order to define the current state of CALL design in Turkey. The findings of this survey will be compared to the findings of the survey of design of international institutions in order to determine the required additions which can realistically be made into Turkish institutions. This comparison will provide the basis of a model of future decision making of CALL in Turkey.

Computer use in education is a relatively new issue for Turkey. The first conference about the subject was held as recently as 1986 in Ankara by the Turkish Educational Association. The Ministry of National Education started studies on Computer Assisted Instruction (CAI) which refers to the wide range of uses of computers for instructional purposes and new information and communication technologies first in 1984. CAI was approached by the Ministry of Education as an issue in which preferences and strategies should be cautiously defined. Making use of the experiences of foreign countries was seen as crucial in the first studies. In order to get in touch with foreign experts in the field, a conference on CAI was held in Istanbul in 1987. At this conference two main issues were discussed: experiences of CAI in foreign countries and problems encountered with CAI in foreign countries. Following this conference, a Pilot Project was started in Turkish secondary schools with the participation of national and foreign companies in the 1988-1989 educational year.

The availability of computers has increased in the last 10 years in Turkey. Despite the fact that computers are still an additional high expense for educational

institutions in Turkey, there are a number of universities and academies which use computers in language teaching namely, Bilkent University, Baskent University, Cukurova University, METU (Middle East Technical University) and the Turkish Military Academy.

Purpose of the Study

Karadeniz Technical University (KTU) is now considering the purchase and installation of instructionally dedicated computer facilities. This makes a survey of design features study particularly appropriate at this time. The format of the study will be designed in such a way as to make it optimally useful for administrators in Karadeniz Technical University.

The purpose of this research study is to provide decision makers with a variety of design models for setting up a CALL lab for use in the Preparatory School of English at KTU. The study will also stand as a starting point for future research on CALL in Turkey by providing a record of the existing CALL usage in Turkey and reflecting recent application in foreign countries.

Statement of the Problem

In Turkey, studies on CAI started twenty years after its emergence and CALL is even more recent. The number of Turkish institutions using CALL is as yet very few. As previously noted, there has been some awareness in Turkey in respect to large commitment to new technological investments for education. Underwood (1984)

mentions that the success of technological aids depends on how they are planned and used. He compares the experience of language lab with that of computers in language teaching:

> Will the computer as a language-learning aid be as great a disappointment as the language lab was? The answer depends not on the nature of the machine but on how people decide to use it. We can swamp computers with exposition and exercises, using them to carry on an outdated and discredited form of teaching, or we can use their power to extend and satisfy our own natural inquisitiveness and desire to communicate. (p. 103)

Some of the main issues of design of CALL lab facilities that have to be considered include maintenance, training, choosing hardware and software or producing software and installation costs (Candlin, 1986). If a computer lab is not designed properly the results will undoubtedly be unsatisfactory.

As CALL is relatively new in Turkey it is possible to make mistakes in planning if decision makers do not make use of the experiences of previous users of computers in language learning. In order to find out about the problems the pioneers faced when setting up and using their CALL facilities, research on the design issues is needed in Turkey. This research will survey the concern for design issues in both national and international CALL labs and provide the data needed for future decision makers, in Turkish Universities in general and in KTU specifically.

Significance of the Study

Karadeniz Technical University has a Preparatory School of English for Postgraduate students. As these students have to follow recent research studies in their field of study they need a foreign language, mainly English. For this reason it is obligatory either to take a one-year preparation or to pass an English proficiency exam before starting their postgraduate education. This preparatory school needs an aid for students who need to do self-study. This aid can be provided by a well designed CALL lab carrying the possibilities offered by the latest additions into CALL which were mentioned previously in the text.

Of particular interest at this moment is the fact that current university computer linkages permit and encourage international communication which is a central justification for second language learning. A study designed and carried out by a language educator, will help validate language educators' claims to a say in new computer installation design and as to means to justify ready access to new facilities for language learning applications as these facilities become available.

Research Questions

This study attempted to determine (A) the critical design issues in designing CALL labs, (B) the various decisions made in respect to these design issues in national and international institutions (C) students' reactions in respect to these design issues.

A. What issues appear to be critical in the setting up of an effective and economical CALL lab?

B. How are the design decisions within these design issues dealt with in various institutions?

1. How are the decisions in respect to setting up a CALL lab made nationally and internationally?

2. What skill areas or uses are the CALL labs designed for?

3. How are the matters of budget dealt with?

4. How are the matters of learner, teacher and staff training dealt with?

5. What materials exist in the CALL labs and how are they organised?

6. What are the working hours of the CALL labs?

7. How are the matters of staffing dealt with?

8. What responsibilities do the staff have?

9. How are the matters of hardware and software selection dealt with?

10. How is the matter of updating the CALL lab dealt with?

C. What are the specific student reactions towards CALL labs?

11. What are the general attitudes of students towards CALL labs?

12. What are the specific attitudes of students towards the way their CALL lab is designed?

13. What factors seem critical to students in respect to the development of the CALL facility in their institution?

The national sources that were consulted were Baskent University, Koç University, Bilkent University and the Turkish Military Academy. These institutions were chosen because they are the main institutions in Turkey which run CALL labs. In addition three of them are English medium institutions. The other institution; the Turkish Military Academy; was included in the study to provide a sample of a state institution among the others who are private universities.

Definition of Terms

Authoring program	A high-level programming language designed specifically for producing educational software.
BASIC	Beginner's all purpose Symbolic instruction code. BASIC is a widely used programming language that is simple and easy to learn.
CAI	Computer Assisted Instruction. Covers a wide range of uses of computers for instructional purposes.
CALL	Computer-Assisted Language Learning. Any use of a computer to facilitate language learning.
CD-I	Computer Disk Interactive. Compact disks can store video, audio and other kinds of computer text storage.
CD-ROM	Compact Disk Read Only Memory. Discs principally used for massive text storage.
CLEF	Computer Assisted Learning Exercises for French
Computer	A language such as BASIC which can be used to write programs.

language

Courseware	Programs designed to help students learn a particular subject.
Database	A store of information organized in a set framework.
Design Issue	All factors which have to be considered in implementing CALL labs.
Design Decision	Institutional decisions made by various institutions in respect to each design issue, how it can be dealt with.
Disk	A form of permanent magnetic storage for computers.
DOS	Disc operating system. MS-DOS is the common operating system for IBM PCs. Apple DOS is the operating system for Apple PCc.
e-mail	A method used to send and receive messages over a network. You use an e-mail program to compose and send a message, and it is sent to a remote mailbox.
Hardware	Computer machinery such as monitors, system units, printers, keyboards, etc. The term is often used in opposition to software.
HTML	Hypertext Markup Language, the document formatting language used to design most World Wide Web pages.
Internet	The largest connection of interconnected networks in the world. These include university, corporate, government, and research networks around the world.
LAN	Long Distance Network. Computers Linked together in long distances.
LISTSERV	A program on a mail server that manages an e-mail mailing list about a particular topic.
Mailing list	A list of e-mail users who are members of a group.
Mainframe	A large time-sharing computer that supports numerous uses simultaneously.
Microcomputer	A relatively small computer that employs a microprocessor. Microcomputers are

	also referred to as personal computers.
Multimedia	Combining different types of data, such as text, graphics, sounds and moving images.
Software	The instructions and information (program and data) given to the computer to make it perform designated activities.
Simulation	A program that imitates realistic events that would otherwise be impossible or difficult to incorporate into the classroom because the presentation would be expensive, dangerous, time consuming, unethical, or otherwise impractical.
Videodisc	An auxiliary storage device that employs laser technology to present audio and video displays. Videodisks can be used in combination with a microcomputer for interactive instruction.
Web page	A HTML document found on the World Wide Web, also referred to as a home page. You can view a Web page using a browser such as Mosaic.
WWW	World Wide Web. A hypermedia-based system that makes easier to browse for information on the Internet. Information available on the World Wide Web is presented on Web pages.

CHAPTER 2 REVIEW OF LITERATURE

Introduction

This chapter reviews literature pertinent to the study. In the first section, literature on educational technology will be briefly reviewed followed by a discussion of the use of computers in education. Educational technology refers to the use of any technological device in education. The strategies and products involved in educational technology give teachers another set of options to supplement the textbook, workbook or standard realia. The language laboratory, audio and video software and television are some examples of technological products that serve education. Computers in education refers in fact to the use of computers in language teaching as one of these products of technology. (Smith, ed., 1989)

In the second section, literature on CAI (Computer Assisted Instruction) will be reviewed to provide a more general perspective about computers in education. In this section a comparison of CAI to other modes of instruction will also be provided. The third section discusses CALL (Computer Assisted Language Learning) which is directly related to language learning and provides a brief history of CALL. The fourth section discusses advantages and disadvantages of using computers in education.

The language laboratory is a good example of the initial use of technology in language teaching. Therefore examination of the use and misuse of language laboratories may be useful in future decision making for

CALL labs. Limitations and problems in the use of language laboratories as technological aids to language learning will be summarized relating the experience to the more current CALL lab. Then literature on CALL labs which are the major concern of this research will be reviewed. The nature of the design issues of CALL labs will be provided in this section.

In the 1990s another major consideration about CALL is the use of computer capacities not designed for language teaching but which form an integral part of today's CALL lab design. It is therefore also necessary to review the literature on computer capacities which are potentially useful in support of language teaching. Next, literature concerning the critical design variables for CALL labs and general requirements of an ideal CALL system is reviewed. Finally, the current state of CALL in Turkey and Turkish CALL studies are discussed.

Educational Technology

The purpose of using technology in education is to enhance the teaching or learning of a particular subject. Technological aids used in education have varied through the years due to advances in technology and efforts at finding the kind of technology which best suits the teaching environment.

Language teachers and specialists have been open to the use of technology in their classes and they have tried different types of technology through the years. Forrest (1993) states that the field of language teaching

can be considered enthusiastic about using products of technology in the classroom, adding that more research is needed on the effectiveness of video and computers for language acquisition. She draws attention to the need for careful selection of material. Teachers need to be guided in discerning effective materials and making selections that accord well with language teaching objectives and course curricula.

Educational technology has evolved from the preservation of the teachers voice with the help of tape recorders, to laboratories and an increasingly sophisticated range of graphic devices from felt and magnet boards to Overhead Projectors (OHTs), film strips, films and recently videotape. All these inventions served, in principle at least, to enhance the teaching process (Phillips, 1986).

In the 1990s there is a wider range of possibilities offered by technology for use in education. The basics in terms of equipment for numerous technological approaches to language instruction are the VCR (Video Cassette Recorder) and the microcomputer. Other possibilities offered by technology are the capabilities of close-captioned video, optical disc technology such as CD-ROM (compact disc read only memory) for microcomputers, interactive videodisk systems that combine the microcomputer with pictures and a variety of software programs. There are also the possibilities offered by satellite transmission, and the picture that emerges is a set of technological applications that are increasingly available and popular in educational settings (Forrest, 1993).

According to Forrest (1993), the benefits of using various technological aids is as follows:

Videotaping students at work on learning tasks provides an opportunity for students and teachers to examine, reflect on and device linguistic and paralinguistic behavior.

Videodiscs combine the interactive nature of computers with the motion picture capabilities of video by means of which, students can guess linguistic information from context, nonverbal cues and reading as well as sound.

CD-ROM systems can store hundreds of thousands of pages of text and are particularly useful in education for keeping large databases. Familiarity with CD-ROM according to Forrest may become an important tool for storing large bodies of information.

She further states that more research is needed on the effectiveness of educational technology for language education and that teachers need to be guided in discerning effective materials and making selections that accord well with language teaching objectives and course curricula.

According to Phillips (1986), the computer is largely different from all other technological aids to language teaching with its potential of changing the teaching process. He thinks that the computer as a new technology promises, or perhaps threatens to change the process of language teaching as he views the convergence of computers and communications as an order of magnitude more powerful than any teaching aids teachers have

been accustomed to using. He further claims that the computer as an educational technology has the potential to be adapted in real time to the needs of the individual student.

Wolfe (1993) discusses his experience with educational technology in his article *Reflections on the use of Technology in my Language Career*. Through his career, he has used various types of educational technology such as the language lab and videotape in the 1960s, the personal computer in the 1980s, laserdiscs and CDs in the late 1980s. His article provides a sequence of the appearance of technological devices in use of language teaching. In his final comments, he gives an overall view of his experience;

> My last five years of work with the interactive laserdisc and CD-ROM have been the most exciting in my language career. Of all the innovations we have experienced in this century, interactive multimedia seem to offer the best hope for significant teaching and learning breakthroughs. Unlike our experience with the language laboratory, I think we are on the threshold of a new frontier in language education. (p. 179)

Wrigley and Guth (1992), state that another approach to using technology in education might focus on helping students access and use computers. The emphasis in such an approach can be put on promoting access to technology and developing computer awareness rather than using the computer to teach ESL and sometimes the kind of literacy 'taught' by the software does not matter as much. They further state that this approach to

technology in education may work well for language programs that are not happy with the ESL software presently on the market.

> By seeing a value in students' using technology for its own sake, not just for the learning of a language and literacy, teachers can concentrate on finding software that is both easy to learn and fun to work with. (Wrigley & Guth, 1992, p. 318)

Wrigley and Guth (1992) suggest that technology based materials be examined critically and that teachers must find ways to integrate video and computers into the best practices that language and literacy teaching has to offer.

Computer Assisted Instruction

In its early years the computer was a large expensive machine which was in use by industrial corporations, government and the military (Higgins & Jones, 1984). The computer started to be considered as an educational medium in the 1940s and in the 1960s CAI (Computer Assisted Instruction) began to emerge as a recognized discipline (Jung, 1991).

The earliest electronic computers were created for and financed by military users, in America to calculate trajectories for artillery and in Britain to decode enemy ciphers. The next applications were in commerce and government administration. Educational uses did not begin until the forties. Computers and computing time were in those days very expensive resources and it was only universities that could afford to become involved. The

advocates of computer assisted learning have always stressed the individualization of instruction and the fact that the learner can work at own pace. However as long as the programmed learning paradigm dominated, pace was the only element that was individualized. The learner was not free to make significant choices about the sorts of activities undertaken, or the order in which they would be tackled (Higgins & Jones, 1984). For this reason it is important to design the activities carefully, considering students' needs. For the effective planning of CAI lessons Steinberg (cited in Kenning & Kenning, 1983) makes some suggestions. He suggests that a plan for designing CAI should include both applicable aspects of known instructional design procedures and features unique to CAI.

A Brief History of CALL

The first projects on CALL were conducted and supported financially by universities, the first of these being The State University of New York at Stony Brook. Underwood (1984) states that this project was unique in that it involved experimenting with a fully computerized German section and comparing the results with conventional instruction.

The first studies were attempts to find out what computers could do in language teaching and how the profession could make the best use of computers. Underwood, (1984) deals with the critique of the programs designed in the 1970s. In 1982 a group of English teachers gathered in a summer institute on CALL and reviewed 25 language programs. The results

showed that they were generally dissatisfied with the software available and convinced that it did not exploit the potential for micro-aided instruction. This made necessary more research on the development of software and testing the effectiveness of software.

Holmes (1990) mentions the entrance of the color micro computer and its applications to grammar and vocabulary learning. He then tells about an inter-university project "CLEF" (Computer Assisted Learning Exercises for French) which offered enriching and stimulating courseware for various researchers.

Wolfe (1993) gives a brief history of CALL in his article, the following quote provides a description of the computers available during the first years of CALL.

> In the 80s, inexpensive computers became available in some schools. They were limited in memory. (64-128 K usually) and much of the material written for them was of the "drill and practice" type. Graphics, color and audio, the ability to get help for a grammar point, and branching exercises were beyond the scope of these pigmy computers. The monitors were small and made large scale use in the classroom difficult. Many teachers had computer phobia and were reluctant to waste class time trying to set up the equipment. (p. 181)

A major contribution of the 1980s was laserdisc technology which is basically videotape that has been pressed on to a disc. Wolfe (1993) reports that this technology has become successful in schools and universities. PICS (The Project for International Communication Studies) at the University of Iowa -has been a major mover in this development.

Today all language skills can be integrated with the help of some authoring programs such as Hypercard, Supercard, Toolbook, Linkway and Dasker. Although the computer provides a great amount of help for the language teacher there is still a problem to be faced according to Wolfe (1993). This is the problem of integrating these technologies and teaching materials into textbook oriented classrooms.

In order to achieve effective use of computers in language teaching there are a number of issues to be considered which are reported by Wolfe. He states that in the future there will be a need to train teachers via in-service opportunities and summer workshops, we will need knowledgeable teachers who know how to evaluate and use computers, teachers must guide publishers as the latter develop materials for the 21st century.

Wolfe (1993) also makes some predictions about what may happen in educational technology in the 21st century such as

> Textbooks will be converted into CD-ROM (Compact Disc Read Only Memory) like discs about the size of a dollar coin which will be played on a portable CD player. Feature-length foreign language films of two hour duration will be available on a disc the size of our

current CDs. The disc will be erasable and can be recorded over (p.183).

He mentions the foundation of the National Center for Computer assisted Language Learning in Canada. The most significant trend of the 1980s for Holmes (1990) was the growing number of CALL developers and the even greater number of CALL users, another significant event was the first Canadian Conference on Computer Assisted Language Learning which indicated that the pioneer's feeling of isolation had finally disappeared.

Advantages and Disadvantages of CALL

Advantages

Higgins and Jones (1984) have stated that computers can replicate human activity only if the activity can be comprehensively and unambiguously described. Whether the computer can replace a human being, is also a controversial issue. It is certain that no amount of electronics could ever replace the warmth and immediacy in contact with another human being. It would be over ambitious to see the computer as a teacher.

On the other hand they state that the computer can take the drudgery out of teaching and by doing all the boring, repetitive work, leave to the teacher the more attractive aspects of the job.

Ahmad (1987) discusses that there are three types of advantages of using computers in language learning; "those which are part of its inherent

nature, those which benefit the teacher and those which benefit the learner."

1. Inherent advantages of the computer include:

It can handle a much wider range of activities than other technological aids.

It can offer interactive learning meaning that it can conduct a two way learning session with the student.

It can repeat an activity with none of the errors which easily arise from repetition by humans.

2. From the point of the teacher:

The computer has versatility in handling different kind of material, one way presentation of information in the form of text, graphics, audio and video.

Unlike a textbook lesson, which the teacher cannot change, the computer exercise can easily be modified.

The computer can handle drill and revision sessions, making more time available for creative and imaginative teaching in those parts of the course where teacher-student contact is more necessary.

3. For the student:

The computer is always available, this allows the student, the choice of when to study particular topics and how long to spend on them.

Distance learning is eminently feasible by computer.

It can tailor packages specifically to the needs of individual students with special learning problems.

For all practical purposes, each student has the computer's full attention and can work at the speed best suited to the individual.

Disadvantages

As a disadvantage, Underwood (1984) speaks about feedback problem and claims that the computer has a weakness of not giving proper feedback.

According to Ahmad (1987), there are some prejudices against the computer, such as 'teachers are made redundant, and students learn everything from computers'. These prejudices may constitute a barrier to a proper understanding of the potential contribution of computers to areas like language learning.

While the computer is able to accommodate a substantial range of learning styles, it is certainly not a complete substitute for a teacher. The computer cannot effectively conduct an 'open ended' dialogue with the student.

CALL programs have to be evaluated; they sometimes leave much to be desired. The development of CALL programs requires knowledge of three fields: competence in the target subject area, pedagogical skills and computing expertise. In language teaching it is seldom the case that any individual is sufficiently versed in all these skills from the beginning.

Teachers must learn to use a new technology. Training on computers may be not only difficult to obtain but also intimidating for some teachers.

A Comparison of the Language Lab and Computers in Language Teaching

Educational specialists warn future decision makers about the handling of educational technology. The language lab provides an example of the misuse of educational technology in language learning. Therefore it is at this point necessary to consider the drawbacks of the language lab as CALL is often compared to the experience of the language lab by researchers who do not want history to repeat itself. Phillips (1984, cited in Candlin et al) looks back at the language lab experience and points to the fact that it is important how people make use of a facility in order for it to be a success.

One of the problems with the design of language labs according to Phillips (1984), was that hardware design was given priority over software design. Another problem according to Phillips was that the lab was not related to the society outside the classroom, in this respect he finds computers more powerful.

Higgins and Jones (1984) also attempt to compare the language lab experience with that of CALL. The reason of failure according to them was the unimaginative tapes used during the fifties and sixties and the underlying theories which were in the process of being challenged and to a great extent discredited.

Higgins and Jones (1984) evaluate the language lab by drawing attention to mistakes made by planners of the language lab. For example the machines were installed in large, unwieldy assemblages which were very

expensive and institutions provided insufficient funding for training and software development.

Another reason for the abandonment of laboratories according to Higgins and Jones is the distrust and fear of machinery which affects all of us. Machines which we do not fully understand and think we cannot control will arouse in us a kind of fear.

The fear of authenticity was one of the factors that caused the failure of the lab according to Higgins (1988). Of all people who teach English, probably no more than a fifth are native speakers. Another fifth, perhaps, are confident and accomplished users of the language, able to speak and write fluently with very few errors and able to diagnose any errors their students make in free conversation. What the language lab did was to face such teachers and their students with evidence of a difference between what the teacher sounded like and what the native speaker sounded like.

It therefore became important to remove this dangerous element of authenticity, and that may account for the many recording projects that took place in the seventies. The recordings were often made with a mixture of native speakers and local teachers, but the words they had to say were taken exclusively from the local syllabus and locally written textbook. The laboratory was being turned into a device to stop learners from learning rather than as a learning aid.

The burden of a large cash investment, the fear of a complex machine and the clash between the comfortable limitations of a syllabus and the

disturbing uncertainty of real discourse led to the decline and widespread rejection of the language laboratory (Higgins, 1988).

One important question is whether the computer as a language learning aid will be as great a disappointment as the language lab. The answer according to researchers depends not on the nature of the machine but on how people decide to use it. Teachers are the ones to decide on using the computer either as an outdated and discredited form of teaching or as a powerful means of extending and satisfying our own natural inquisitiveness and desire to communicate.

Higgins (1988) states that there are lessons to be learnt from the failure of the language lab:

> The lessons we can learn from the language laboratory experience are not to impose computers on staff who have not been prepared or trained to use them, to put more money and effort into developing software than into acquiring hardware and to use small, flexible units rather than large, centrally-controlled installations. Computers then become aids under the control of teachers and learners; they are slaves, not masters (p. 14).

Current Developments in CALL Computer Capacities and Computer Networks in CALL

The Internet, E-mail and Discussion Lists

A major advent of the 1990s in computer technology is the emergence of computer mediated communication (Warschauer, 1995). Computer mediated communication is being used in the language classroom with the supposed benefits of more equal participation among students.

A study was done at the University of Hawaii by Warschauer in order to test this claim by comparing face-to-face and electronic discussion. The findings of this study showed a tendency towards more equal participation in computer mode and revealed some factors which correlated with increased student participation in that mode. The study also found that students used language which is lexically and syntactically more formal and complex in electronic discussion than they did in face-to-face discussion, thus demonstrating another possible advantage of computer mediated communication.

Paramskas (1993) speaks about the most recent contributions of computer technology to language teaching. The Internet is the largest collection of interconnected computer networks in the world. These include university, corporate, government and research networks around the world. Millions of systems and people are connected to the Internet through these networks (Internet Glossary, 1997). Paramskas reports that today about one

million people use the Internet daily and that information traffic rises by 12% each month. There are also discussion groups available through the Internet and e-mail (electronic mail) which is a method used to send and receive messages over a network. For discussion groups, an e-mail program can be used to compose and send a message, and it is sent to a remote mailbox, where it can be retrieved and read by the addressee. Mail which is sent to the group address is distributed to all other subscribers.

The Internet also supports mailing lists, discussion groups, reflectors, aliases or LISTSERVs which are programs on a mail server that manage e-mail mailing list about a particular topic. It is possible to automatically subscribe and unsubscribe from a mailing list with the help of a LISTSERV program. Subscriptions to the mailing lists are free. Every kind of information can be exchanged through these lists. Paramskas points to the possibility of using the Internet for discussion purposes and draws attention to other ways of benefiting from the mailing lists for educational purposes. Today there are numerous e-mail discussion lists which are used by language teachers and language learners. E-mail provides a great deal of language exchange between both language teachers and learners. If nothing else, e-mail lists are ways to locate native speakers. Webpages, HTML (Hypertext Markup Language) documents found on the WWW (World Wide Web), also offer resources for both language learners and teachers.

The computer can also perform the function of the VCR (Video Cassette Recorder) with the use of videodisks. Videodiscs combine the

interactive nature of computers with the motion capabilities of video. Moving pictures, still pictures and sound are stored on discs that are accessed by videodisk players or computers (Forrest,1993). An evaluation of interactive videodisk by Chin (1995) has concluded that incorporating CALL strategies into the regular curriculum is useful.

Multimedia

Multimedia computers that deliver video, audio, graphics, pictures and sound using CD-ROM technology are becoming more common at home and in education. The ability of the computer to provide video and audio in combination with text is an important advance that has exciting implications for the development of computer-based language learning programs (Brett, 1996).

CALL can now exploit the written medium and also the overall visual medium, thus language learning multimedia software would appear to be a useful and innovative new language learning tool. Multimedia language learning programs are therefore beginning to appear for a variety of purposes and are aimed at various types of learners. Some reference works are: Longman Interactive Dictionary 1994, Desktop English, Triple Play Place (1994), and an Introduction to a British Company (1994).

Some research into the effectiveness of interactive video systems, the forerunner of multimedia, reported favorable learner attitudes and preliminary indications of effectiveness. The main findings of one study

show very strong favorable responses to using multimedia in all the dimensions investigated and some preliminary evidence that perhaps weaker learners held more positive opinions about it (Brett, 1996).

Computer Networks

Computers linked together in networks are expanding the way foreign languages are taught and learned. Local area networks (LAN) are computers linked together by in a classroom, lab or building. For example, LAN set-ups like the ENFI system at Gallaudet University and the HIPERNET(High Performance Networking) Project at Cambridge University provide an interactive mode of learning (Higgins, 1993). Expanding the unique capabilities of the LAN, long distance networks -or computers linked together in long distances - facilitates communication with students throughout a country and abroad. Computers can communicate across thousands of miles via modems and phone lines using telecommunications software.

Critical Design Variables for CALL Labs

Peters (1981) provides a number of definitions for design in CALL, one of which approaches design as a set of issues. This view requires the designer to identify the issues critical to the success of the design effort, and then to define design elements necessary to meet the critical issues adequately.

Peters (1981) claims that design is neither a formulatable nor a deterministic activity. It does not have prescriptive or sequential steps that will ensure success. It is also not possible to exhaust all reasonable variations and avenues of inquiry to reach an acceptable design. The process of design could essentially go on forever. This view is relevant to the nature of CALL because this field is a fast changing one; computers are devices which are developing steadily, new programs are developed everyday to meet the needs of the users. This change is also reflected in the use of computers in language teaching. Nothing is steady, but defining the critical issues at the beginning of the design act, sets limits to the problem at hand. These issues can put the problem into an overall perspective within which secondary, more detailed issues can be effectively addressed. Peters (1981) states that both critical issues and design elements serve to direct and limit design of a system, but each should be confined to its own role.

The questions raised by the computer in its applications to language teaching and its temptations are far subtler than any other educational technology. It is important that teachers and practitioners take control of the new technology in the profession of language teaching. Without control, technological progress will remove the power of decision from the hands of language specialists and teachers (Philips, 1986).

It is also important to consciously create the desired environment with the computers and to know what one wants the computer to do. This is the fundamental design question that must be addressed, whether overtly or

implicitly in any development work in CALL. What sort of learning environment do we want to create by means of the computer? We have to be clear about the nature of the learning environment we are creating by the use of educational technology.

If we approach design as a whole made up of small parts, that is critical issues, and use such a definition for the design of a CALL lab, the first thing to do is to identify the critical issues. Demirtas (1995) in her survey study on the setting up process of self access centers has referred to the critical design issues involved in establishing a self access center. Although Demirtas' study addresses self access, it is still the same kind of research and there are similarities in the methodology. While investigating design features the Demirtaþ has first identified the critical issues. The next step after identifying the critical design issues is to consider the decisions made in respect to the design issues in various institutions.

Several authors such as Hawkridge et.al. (1990), Kenning & Kenning, (1983), Wyatt (1984), Coburn, (1985) have also dealt with the important issues involved in the design of CALL. In identifying the critical design issues for the setting up of a CALL lab, the above mentioned sources have been reviewed. The critical design issues identified for CALL labs and for use in this study are: decision making, budgeting, training, hardware and software selection, software development, maintenance, obtaining appropriate space, scheduling for use and staffing. These issues will be

briefly discussed in the following sections. These issues are not ordered according to their importance.

Decision Making

In the larger sense, this study is intended to be input to decision making. Two of the well known models for decision making are the CIPP Model (Stufflebeam, 1971, in Johnson, R.K 1994) and the Discrepancy Model. (Provus, 1971, in Johnson, R.K 1994). Both of these models contain elements similar to Design Issues and Design Decisions which are two particular focus topics of this study.

The CIPP Model comprises the elements ; evaluation performed in the service of decision making, evaluation as a cyclic, continuing process and interface activities. Of these elements decision making and the continuing process of evaluation are parallel to design issues and design decisions.

The Discrepancy Model comprises the elements; program description stage, program installation stage, treatment adjustment stage, goal achievement analysis stage and cost-benefit analysis. The first two items, program description stage and program installation stage are parallel to design issues and design decisions.

In the narrower sense, the concern of the study is with decision making in respect to computer use in educational settings. In Coburn et. al. (1985) three approaches for decision making for computing facilities are

discussed. The decision making can depend on either a centralized approach, a decentralized approach or a shared planning approach.

Large schools with strong general administration tend to handle all decision making in a 'centralized', usually top down fashion. On the other hand, when there is a weak or no administration support for computing, individual teachers or parents, sometimes acting alone, sometimes in cooperation with their colleagues, and sometimes in cooperation with the school principal, can be responsible for introducing computers in the classroom. This kind of decision making is called 'the decentralized approach'. However, even when two or three teachers join forces, without administrative support, their efforts are unlikely to pay off for very long. The schools sometimes begin their efforts by creating a broadly representative committee to study computing needs and goals and thereby share planning and decision making among teachers, parents and administrators, which is the 'shared planning approach' to decision making. This kind of approach has some advantages over the other two approaches. This approach depends on a broad base of support for computing in the schools, and a concentration of financial and human resources on designated projects.

Budgeting

As reported in a Johns Hopkins survey, nearly two thirds of all funding for school microcomputers comes from combined "local sources" within the existing school budgetary apparatus (Pennington, 1985). It is only after these sources have been exhausted that people seek funds or equipment from outside the school.

Internal Sources of Funding

In most schools, departments or teachers submit annual budgets for books, equipment and other expenditures. One strategy for obtaining funds from internal sources is to persuade several departments or teachers to allocate some portion of their budget for that purpose.

External Sources of Funding

Another approach is pursuing external sources of funding. The chance of receiving most government funding is improved if it can be demonstrated that the local system has already made a financial commitment to computers.

Other than foundation support, most private assistance is likely to come in the form of donated equipment or services, rather than money. Large corporations with local plants are particularly appropriate targets for requests of assistance.

Another major source of expertise and access to computer time suggested by Pennington (1985) are institutions of higher education, both

private and public. For example Dartmouth College in Hanover, New Hampshire has an extensive time-sharing system that includes 600 terminals distributed all across campus. This kind of arrangement is not yet available in Turkey.

In Turkey, funding usually comes from the internal sources in private Universities and public Universities such as Çukurova University are supported by large companies.

Maintenance and Organization

Forrest (1993) gives some guidelines about the organization and maintenance of a CALL lab.

> Setting up a microcomputer lab is easy compared with the day-to-day organization and maintenance of the hardware, and more importantly, the software. Hardware presents few problems. Modern microcomputers are relatively trouble-free. They consist mainly of solid-state electronic components which either work or fail. If they fail, they are simply replaced. (Forrest, 1993, p. 24)

The only two problem areas identified by Forrest (1993) are the keyboards and disc-drivers, which are significantly, the only components with moving parts. She advises that regular maintenance checks should be carried out by a competent technician, but also states that microcomputer laboratory hardware is generally easier to maintain than language laboratory hardware. Ealing College has preferred having computers with separate disc drivers. They have rejected the ECONET system, which enables several

computers to share a common disc drive, on the grounds that this offered insufficient flexibility. With ECONET, all students using the microcomputers are obliged to work on the material stored on the discs in the common drive and this requires a member of staff, a technician or teacher to be present at the time the laboratory is in use.

If each computer has its own disc drive, then it is easier for students to use the microcomputer lab on a self access basis, but that does not rule out the possibility of the laboratory being used by groups under the supervision of a teacher.

Maintaining a software library is in many respects similar to maintaining audio-tapes according to Forrest (1993). Both dislike dust, smoke, magnets, damp, heat and metal storage cabinets. Master copies of storage media have to be locked away safely, students' copies must be checked regularly to ensure that the material they contain is in good condition.

Training

Training Teachers and Staff

Training courses explained by Smith (1989), usually consist of a mixture of presentations of a variety of CALL packages to the whole group, with suggestions on how to make use of them in the classroom, backed up by plenty of hands on sessions in which teachers can familiarize themselves with selected programs. In longer courses, teachers may be offered training in the use of computer operating systems and an introduction to

programming. Cooperation with other institutions is also useful for training according to Smith (1989). CCALL (Center for Computer Assisted Language Learning) welcomes requests from organizations that wish to make use of CALL facilities for training and arrange for staff to travel to other institutions to give guest lectures or to help run courses.

In service training is also a possibility for institutions who want to provide enough expertise to their teachers. Higgins (1988) talks about in-service training courses and makes an evaluation. Most training courses in CALL are in-service courses rather than initial training; it is currently thought more important to give short courses to practicing teachers who are already supplied with machines rather than train new teachers who may not have access to computers for some time. Coburn (1985) also suggests that for effective staff development in educational computing, an on-going in-service program is needed. He gives some suggestions for this kind of a training program. According to Coburn the training workshop should be run by the school's own experts so that they are available for follow up questions or problems. Hands on experience is another factor emphasized by Coburn, he suggests that at a minimum, half the training time is at the keyboard. The initial exposure to the computer should include a strong dose of non-mathematics experiences, such as word processing. After a while the teachers can be exposed to a variety of computer languages to promote an understanding of the flexibility of computer languages.

Higgins (1988) claims that pre-service training has some benefits over in-service training. Perhaps the most important product of pre-service training will be not great skill in handling the machines but simply demystification of computer, removing the element of fear.

Candlin (1986) states that teachers with a background in the arts are prone to fear machines and must be helped to overcome this fear. A training course therefore should include an introduction to the nature of the computer and its limitations. The essential theoretical aspects of CALL should be covered, but 'hands-on' sessions are by far the most important part of any training course.

Training Students

Most students need only a brief introduction to CALL: how to switch on the equipment, insert disks, how to start a program running-using the 'autoboot' facility. (Candlin, 1986)

> At Ealing College awareness of computer is considered important, so all students in the Applied Language Studies degree course have to follow a series of ten lectures on computer applications to language, as well as participating in ten one-hour practical programming sessions in BASIC. This takes place during their first year.

Selection of Hardware

Fortescue et. al. (1987) have dealt with the principles of choosing hardware. Some of the criteria in question form include :

How much does it cost? Are there any discounts available for educational purchases or bulk buying? For a teacher buying a machine out of pocket, a second-hand machine is a possibility. How much memory does the computer have? Can you understand the user manual? Can the computer be serviced totally?

In the conclusion he gives useful suggestions to be followed before buying hardware. Some of these suggestions include getting advice from computer journals and colleagues and from schools who are already using CALL, going to different shops, phoning firms and going to computer exhibitions.

Selection and Development of Software

There are mainly six kinds of software. Of these types of software the drill and practice type is the most traditional one and it depends on the repetition of exercises many times in order to assure mastery and is therefore referred to as electronic worksheets. Games entertain the users and many of them instruct as well. Tutorials move step by step to mastery of the language, they take the students from 0 level to an individual rate. Simulations mimic real-life situations. Problem solving programs require higher-order thinking associated with complicated plots. (Becker, cited in Smith, 1989)

Coburn et. al. (1985) suggest that a computer is the software it runs. Such a view puts a great deal of importance on software evaluation, selection and development. In some cases, the selection of hardware may depend on

the selection of software. You may first select the software according to your needs and then look for a computer to operate it on. Coburn et. al. (1985) talk about some critical points for evaluating software:

> Buy software that does what you need it to do. Establish and verify software support. Thoroughly test the software. Look for good error checking. Look for consistency and good design in prompts and program commands. Demand fast and flexible data retrieval. Buy software that makes the computer work. (p. 85)

Underwood (1984) lists some questions to be asked when selecting software:

> Does the program run without getting stuck?
>
> Are there any language errors?
>
> Are the instructions clear?
>
> Does the program make good use of the computer?
>
> Is the program pedagogically sound and worthwhile?

According to Candlin et. al. (1986) evaluation of software consists of two variables: design evaluation and pedagogic evaluation. Design evaluation looks at the technical design of the program, loading and running, impressions such as color, sound and layout and flexibility. The pedagogic evaluation is intended to provide clearer guidelines of use.

Balas (cited in Smith, 1989) explains the software development at Western Washington University to provide an example. The program development is guided by nine pedagogical goals and it consists of three phases:

1. The design of the overall program
2. The actual programming of the software
3. The use of editing units to create lessons that the students can use effectively.

Keith and Lafford (cited in Pennington, 1989) also describe a three phase approach to software design which has three phases: pre design, design and post design. Pre design is similar to the definition of design issues in this study, and post design is similar to design decisions within the design issues. The pre design phase starts with determining how much time can be devoted to the process as development of software is a time consuming activity; Johnson (1986) estimates 600-1000 hours of development time for a single lesson. Selection of staff is also important and must be done carefully. Next a needs assessment should be done in order to ensure that the final product will be applicable to the education program and student audiences for which it is intended. A survey of the available courseware is also essential because finding out about the strengths and weaknesses of different programs can give an idea to the developers.

General Requirements of an Ideal CALL System

Cameron (1989) has stated some important general features which he believes any CALL system should possess. Some of these features include:

The system should have some pedagogic value and provide an interesting environment in which to learn.

The system should provide quasi-immediate responses, users should not be kept waiting unduly for system responses.

The system should correct user errors whenever possible.

The system should accept free input, and be wide range enough to cope with arbitrary sentences and not confine the user to a narrow range of input.

The system should be robust.

The system should be capable of expansion, new ideas, new approaches, new areas should be readily accommodated.

Consequently it must not be idiosyncratic; it must use methods that are both transparent and reproducible.

CAI in Turkey

Preferences in Computer Assisted Instruction

In Turkey, The Ministry of Education started utilizing CAI (Computer Assisted Instruction) and new information and communication technologies first in 1984. In 1984, 1100 microcomputers were purchased

for use in secondary schools and the computer started to be used as an aid to instruction in addition to courses on computer literacy. CAI was approached by the Ministry as an issue in which preferences and strategies should be cautiously defined. Making use of the experiences of foreign countries was seen as crucial in the first studies. In order to get in touch with foreign experts in the field, a conference on CAI was held in Istanbul in 1987. In this conference, two main issues were discussed: experiences of CAI in foreign countries and mistakes concerning CAI in foreign countries. Following this conference a Pilot Project was started with the participation of national and foreign companies in the 1988-1989 educational year.

The points that were dealt with during the pilot projects were:

- Syllabuses
- Authoring, software design
- Teacher training
- Equipment
- Maintenance and repair

a. Syllabuses: Courses related to the computer were defined in four ways in the syllabus:

- Presenting the computer, teaching its abilities and functions.
- Teaching computer programming as a separate discipline.
- Using the computer as an aid to the teaching of different courses.
- Giving information about the repair and maintenance of the computer.

b. Authoring, software design: The software developed for educational purposes should match the goals of the educational system.

c. Teacher training: Teachers are viewed as people who manage the computer and create the connection between the learner and the computer. Teacher training is considered as an important factor for Turkish CAI. In Turkey the usage of computers in education is relatively new and this factor makes it difficult to train Turkish teachers who have a traditional educational background. Teacher training programs follow similar principles to those in foreign countries. There should be limited training to a large number of teachers, advanced training to a small number of teachers.

d. Equipment: A piece of equipment adequate for today is becoming inadequate and out of fashion in a few years time. Due to limited resources, Turkish institutions cannot always keep pace with the technology developments. Turkish CAI specialists agree that choice of equipment is very important. The basic equipment should serve at least through the 1990s and should be open to expansion. Turkish institutions obtain computer equipment mostly from the foreign market which is very expensive for Turkey. It has been stated that computer technology should be encouraged in Turkey and a national industry should emerge with international information and resource support.

Preparation for CAI in Turkey (1984-1988)

Starting from the 1985-1986 term 1111 computers were provided for 101 secondary schools. In each school two teachers were trained for five

weeks in in-service training courses. In the 1988-1989 term computers were provided by the World Bank and used in technical secondary schools.

In the 1985-86 term 130 computers were provided for Secondary schools of Commerce, Tourism and Hotel Management. In-service training programs were started in all secondary schools.

General Evaluation of the Studies

An overall evaluation of the CAI studies published by the Ministry has suggested the following conclusions:

- Providing the computer equipment and teaching BASIC to teachers has not made a remarkable increase in the effectiveness and productivity of education.

- Training has 3-5 times more importance than equipment.

- The aim is to create teachers who use educational computer programs not those who produce them.

- CAI Programs should be in harmony with the principles of education, competent to the computers and flexible.

Cooperation between institutions which produce communication and information technologies and universities is encouraged in order to find ways of making more effective and productive use of computers in education.

Turkish researchers have been studying CAI since the late 1980s. The following are examples of Masters theses focusing on CAI. Gürol

(1990) has investigated teacher opinions and attitudes towards the computer as an educational tool. Keser (1988) has attempted to develop a model for Computer Assisted Instruction. Çomoðlu has worked on a system development and project for CAI on Pascal. Samur (1989) has investigated CAI and its implementation. Orhon et. al. (1990) have carried out courseware development work in the Department of Computer Science and Engineering at Ege University on Macintosh computers using Hypercard and Coursebuilder software.

CALL studies in Turkey mainly focus on courseware development for language teaching. Some examples are the following; Öz (1991) has investigated Macintosh-oriented language instruction, Sezer and Öz (1993) have investigated Computer assisted programmed language instruction (CAPLI) in their study, Koç (1991) has worked on scenario development for English Language teaching on Macintosh environment. Masters theses by Öz (1991) and Türker (1990) also focus on courseware development in CALL.

Now that the related literature has been reviewed, the next chapter will provide the details about the methodology of the study.

CHAPTER 3 METHODOLOGY

Introduction

This study is a descriptive study which attempts to provide Karadeniz Technical University with the design and planning information needed in order to set up a CALL lab of optimized benefit and affordable cost. In recent years, the computer and its capabilities are being increasingly used in language teaching. Many language teaching institutions abroad have included a CALL (computer assisted language learning) lab in their facilities to offer more up-to-date language teaching to their students. Turkey is also becoming involved in this movement through the efforts of mainly private universities and military academies.

It is widely accepted by educational specialists that the success of any technological aid will depend largely on how people plan to use it. It is at this point crucial to define the critical design issues and consider them in the decision making in respect to a new CALL lab. KTU has a preparatory school of English for students who want to do postgraduate study; the institution is also at the initial stages of applying English medium instruction in its Electronics and Computer Engineering departments. A Preparatory School of English will be opened for these two departments. KTU is in the initial stages of designing a CALL lab for use mainly by students who are learning English in the above mentioned preparatory schools of English. This study will aid the decision making of a CALL lab suitable for KTU in terms of budgeting, staffing and selection of equipment. To provide KTU with information regarding the critical design issues, national and international experiences with the design of a CALL lab will be surveyed in this study. The previous experiences of both national and

international institutions -both positive and negative- will be useful for helping future decision making in Turkey.

By surveying the institutions in respect to the design issues, the study attempts to answer the following questions:

A. What issues appear to be critical in the setting up of an effective and economical CALL lab?

B. How are the design decisions within these design issues dealt within various institutions?

1. How are the decisions in respect to setting up a CALL lab made nationally and internationally?

2. What skill areas or uses are the CALL labs designed for?

3. How are the matters of budget dealt with?

4. How are the matters of learner, teacher and staff training dealt with?

5. What materials exist in the CALL labs and how are they organised?

6. What are the working hours of the CALL labs?

7. How are the matters of staffing dealt with?

8. What responsibilities do the staff have?

9. How are the matters of hardware and software selection dealt with?

10. How is the matter of updating the CALL lab dealt with?

C. What are the specific student reactions towards CALL labs?

11. What are the general attitudes of students towards CALL labs?

12. What are the specific attitudes of students towards the way their CALL lab is designed?

13. What factors seem critical to students in respect to the development of the CALL facility in their institution?

Research Design

The experience of CALL labs nationally and internationally was sampled in the following way: To deal with the national sampling, the administrators and staff in four tertiary level institutions were interviewed during on-site visits. In addition students using the CALL lab facility in their institution were given questionnaires. To deal with the international sampling, the administrators of CALL labs of a number of international language teaching institutions were contacted and interviewed through e-mail.

A number of variables were examined while conducting the samplings. The critical design issues had to be defined in a review of the CALL literature, the design issues which made up the first set of variables were determined to be: selection of equipment (software and hardware), staffing, scheduling for use, budgeting, obtaining appropriate space and location, maintenance, and establishing links with users, that is encouraging users to use the lab efficiently.

How administrators dealt with and how students reacted to these design issues were examined. The next set of variables were the decisions made in respect to the

design issues in various circumstances and by differing institutions. These were labelled "design decisions". Therefore administrators were interviewed in four tertiary level institutions in respect to CALL lab design decisions and questionnaires with students were administered in two institutions in Turkey.

Finally, to see if different student groups have different reactions to the experience of CALL lab, one student characteristic was included in the study. The student characteristic variable was the language proficiency level of the students.

The questions in the interview and the questionnaire aimed at determining the priority in critical design issues and administrative responses to design decisions. Responses were coded and categorised in the institutional analyses.

Subjects

For the National sampling, tertiary level subjects were chosen from Bilkent University, Baskent University, Koc University (all of which are private institutions), and the Turkish Military Academy. In the national sampling, there were three kinds of subjects; administrators who were involved in the decision making process for the existing CALL lab in their institutions, CALL lab staff and students who use the CALL lab. In the international sampling the subjects were CALL experts from foreign countries.

Administrators and CALL lab staff of CALL labs at Turkish institutions and foreign institutions were one set of subjects. 3 administrators and 5 CALL lab staff were interviewed in on-site visits in the four Turkish institutions which took part in the study.

For the international sampling fourteen institutionally-based CALL experts from ten different countries were contacted by means of e-mail (see Appendix C). Experts from three of these institutions, all of which are located in the United States, responded to the interview questions. These experts were from Michigan State University, Oregon State University and the University at Albany, State University of New York. These institutions were included in the study as international samples and will be referred to as international institutions hereafter.

Student subjects were chosen from Bilkent University and Koç University. Students were chosen randomly except for their proficiency levels. Students of intermediate level proficiency and upper intermediate level proficiency were identified and given questionnaires. Eleven intermediate and ten upper intermediate students from Koç University and thirty intermediate and twenty four upper intermediate students from Bilkent University were given questionnaires. The total number of student questionnaires were seventy five.

Setting

The national institutions participating as mentioned previously, were Bilkent University, Baþkent University, Koç University and the Turkish Military Academy. These institutions were selected as they are the major post-secondary institutions in Turkey which are running CALL labs. In all three private universities, Koç, Bilkent and Baþkent, the medium of instruction is English. The Turkish Military Academy was chosen to provide a sample for a public institution running a CALL lab. A

secondary question was to see if the study identified differences between private and public institutions or between university and military establishments in respect to the CALL lab.

Materials

The data needed for the study was collected through interviews and questionnaires.

The Interview Questions

Thirty-five interview questions, found in Appendix A, were addressed to the administrators of foreign CALL labs and administrators and staff of national CALL labs. The questions related to CALL lab design issues can be grouped under eight headings. These headings are as follows:

1. Questions on decision making for the CALL lab.
2. Questions on uses of the CALL lab.
3. Questions on budgeting issues.
4. Questions on staffing issues.
5. Questions on training issues.
6. Questions on working hours of the CALL lab.
7. Questions on maintenance issues.
8. Questions on selection of equipment.

The Questionnaire

The student questionnaire consisted of four parts and thirty-two questions, and was designed in order to obtain students' opinions on the following. The first part inquired about students opinion on CALL labs in general, the existing CALL lab in their institution and how they used the CALL lab in their institution; the second part sought their likes and dislikes about the CALL lab in their institution; the third part asked for students attitudes towards the way their CALL lab was designed, the last part solicited student opinion on ways of improving the existing CALL lab in their institution.

Data Collection

The data needed for the national sampling was collected through interviews and questionnaires. Interviews with the administrators and CALL lab staff were conducted by means of on-site visits. Data from the administrators of foreign CALL labs was collected via e-mail.

The questionnaire was given to students in their classroom during their regular class hours and was administered by the classroom teacher. The students were chosen randomly except for their proficiency levels. They were asked not to give their names to encourage more honest answers.

The following classes of data were collected from the questionnaire:

The data about the concern for design issues of national and international CALL labs from the administrators, teachers and CALL lab staff.

The data about students' attitudes towards the CALL lab in general, their points of view on the CALL labs in their institution and their preferences concerning an ideal CALL lab.

Data concerning students was summarised in tables showing the means and standard deviations of the variables for student rating questions and tables which show percentages and frequencies for the tick-all-that-apply questions. The responses concerning CALL lab decisions made were compared across groups.

Analytical Procedures

This study was designed to assist decision-making in respect to a design for a new CALL lab for language learning. The decision makers need a data reporting format which will serve their purposes. Analysis and presentation of interview data was done in as detailed and conversational format as possible. Responses to the one ranking and one rating question on the interview were reported on tables. The ranking question required the interviewees to order design issues according to their degree of importance in the initial stages of setting up. The rating question required them to rate each item in a five point scale. For the ranking question Kendall's W Coefficient of Concordance was employed in order to compare the responses across national and foreign interviewees.

The data collected in order to do the national sampling by means of questionnaires are also presented in detail. The responses of the students to each question on the questionnaire were reported in tables showing means and standard

deviations as well as tables showing frequencies and percentages. Significant differences between groups were indicated for items by doing T-tests to determine whether these differences were significant or non-significant.

CHAPTER 4 DATA ANALYSIS

Overview of the Study

This study is a survey which aims to provide KTU (Karadeniz Technical University) administrators with the design and implementation information needed in order to set up a CALL lab of optimized benefit and affordable cost. Administrators of KTU's Preparatory School of English for postgraduate students are in the process of establishing a CALL lab to facilitate students' language learning. This study provides data on the critical design issues administrators should consider when establishing a CALL lab and discusses evaluatively design decisions made by various institutions in respect to these issues.

The study surveyed both national and international CALL labs concerning design and implementation issues. In the study, four CALL labs in Turkey and three CALL labs abroad were sampled. In the Turkish sampling, three universities namely Bilkent University, Başkent University, Koç University, and the Turkish Military Academy were included. The international sampling included three universities in the United States namely the University of Albany, Michigan State University and the University of Oregon.

Critical design issues were determined to be the following: selection of equipment (software and hardware), staffing, scheduling for use, budgeting, obtaining appropriate space and location, maintenance and establishing links with users, that is encouraging users to use the lab efficiently.

The focus of the study was to determine how various institutions made decisions in response to these issues while setting up and operating their CALL labs.

The sampling was done through two instruments. The first instrument consisted of thirty-five interview questions which were given to administrators who were involved in the establishment of the CALL lab in their institution and their CALL lab staffs. For the international sampling the same interview questions were sent to administrators of CALL labs via e-mail. The interviews in Turkey were administered at four institutions; Baþkent University, Bilkent University, Koç University and the Turkish Military Academy.

The second instrument was a questionnaire which consisted of four parts and thirty-two questions, and was designed in order to obtain students' opinions on several issues. The first part sought students' opinions on CALL labs in general, the existing CALL lab in their institution and how they used the CALL lab in their institution; the second part sampled their likes and dislikes about the CALL lab in their institution; the third part asked about student attitudes towards the way their CALL lab was designed, the last part dealt with student opinions on ways of improving the existing CALL lab in their institution.

The student questionnaire was administered at Koç University and Bilkent University. The students were chosen from both intermediate and upper intermediate level preparatory class students who used the CALL lab with their teachers as a class. This was to insure that students were familiar with the CALL lab. Students from the two other institutions were not sampled as the use of the lab was highly limited in these institutions. The institutions were chosen because they identified themselves as the main tertiary level institutions in Turkey which are running CALL labs.

This research was a descriptive study comprising a survey of CALL labs designed to provide the researcher's home institution, and any other interested

institution, with detailed descriptions and analyses of CALL labs both in Turkey and abroad. The interview questions which were asked to administrators and CALL lab staff were designed to provide administrators with design insights from other users' experience with CALL labs.

Data Analysis

Data are analyzed in the following way. In the first section, the answers of administrators of English departments and CALL lab staff to the interview questions are presented. In the first part of this section, the results of the national sampling are presented. In the national sampling, for convenience of referencing, codes were used for institutions as follows; A: Başkent University, B: Koç University, C: Bilkent University and D: the Military Academy. In the second, the results of the international sampling are presented. The format of data presentation in this section is in the form of summary comment. In this section, responses were categorized under general headings with names of the respondents not indicated. The responses to one ranking and one rating question in the interview are presented in tables. For the rating question, means and standard deviations were found. For the ranking question in the administrator interviews, the responses were compared across respondents using Kendall's Coefficient of Concordance.

In the second section, the responses of the students to each item in each question of the questionnaire were analyzed and the means and standard deviations (or frequencies and percentages of each item according to the nature of the question) were reported in the data analysis. Summaries of the data are presented in tables which show the means and standard deviations of the variables for student rating

questions and tables which show percentages and frequencies for the multiple choice questions.

Results of Interviews with National and International CALL Lab Staff and Administrators

One of the research questions concerned the decisions made in respect to the design issues in various circumstances and by differing institutions. Interviews were done to see to see what responses various institutions had made in respect to dimensions within the critical design issues for a CALL lab. The answers of the interviewees to the interview questions were summarized and categorized in tables according to the subject of the question. In this section of Chapter Four, the responses of the administrators and staff of the national CALL labs are summarized by means of tables. In the next section, the answers of administrators of international CALL labs are summarized by means of tables.

The responses are grouped in order to provide decision makers with an insight into the experiences of administrators and CALL lab staff who have been involved in the setting up or administering of CALL labs.

The questions that both the national and the international interviewees were asked were grouped under various topical headings in tables as given below;

Responses of Administrators and Staff of National CALL labs

Decision making for the CALL lab:

Table 1 provides responses to Q1 and Q2 on the interview. These questions deal with identifying decision makers in setting up the CALL lab in national institutions and how these decision makers were determined..

Table 1.

CALL Lab Decision Makers and Their Determination in National Institutions

Institution	Decision Makers	Determination of Decision Makers
A	Head of English Department	interest in computers, experience
B	Dean, Head of English Department	by the administration, interest in computers
C	Head of English Department	experience with computers
D	Dean, Head of English Department	interest in computers , experience with computers

The initial decision for the setting up of a CALL lab is usually made by the administration of the institution, the Dean or the Head of Department. The institutions which make an affirmative decision regarding setting up a CALL lab have a common quality which is commitment to enhancing use of technology in education.

The administration determines the initial decision makers according to the degree to which they are interested in computers and technology in education. All teachers are also encouraged to take part in the initial stages, selecting materials and making recommendations for the lab.

Skill Areas

Table 2 provides responses to Q3 and Q4 on the interview. These questions deal with the uses and skill areas the lab was intended for and the rationale behind this decision..

Table 2.

Skill Areas and Rationale for Skill Areas

Institutions	Skill Areas	Rationale
A	integrated skills, pronunciation, grammar	integrated skills is important for communication
B	listening emphasized, practice, vocabulary, grammar, some reading, e-mail, Internet	skills that students have problems with such as reading and writing or grammar.
C	reading emphasized, grammar practice, vocabulary	complete class-work, for practice and work on extra material
D	receptive language skills, listening, reading,	curriculum decisive in determining , providing enough receptive stimuli

The responses to the third question were varied, which may be due to the fact that there are different aims underlying the setting up of a CALL lab for every institution. Of the four institutions, two of them have included all four skills in the design of the CALL lab. It was observed that the curriculum and the needs of the students affects the uses the lab is designed for. Another factor is the aims of the institution, for example, teaching language for communication or providing enough receptive stimuli for the students in the CALL lab..

Budgets

Table 3 provides responses to Q5, Q6, Q7, Q8 and Q9 on the interview. These questions are related to the budgeting issues of the CALL lab.

Table 3

Budget Issues

Institution	Budget Supply	Control of Budget	Budget Needed for Setting- up	Maintenance Budget	External Sources of Funding
A	university budget	head of department	$ 50,000 US..	no fixed budget for maintenance	none
B	university budget	head of department	no definite figure for hardware, $12,000 or $15,000 US for initial software	no fixed budget for maintenance	none
C	university budget	head of department	basic software cost $12-15,000 US.	No fixed budget for maintenance	none
D	a foundation	head of department	5 billion Turkish Liras in 1995 for the initial setting up	no fixed budget for maintenance	at the initial stages

Three of the four institutions have a budget provided from the internal sources of their own institution. Administrators and CALL lab staff stated that they reported their needs to the school administration, and they usually could get their needs supplied. The great expense is generally at the beginning stages, in later stages relatively less is spent for maintenance, materials production and upgrading. One of the institutions provided for the CALL lab by contacting the budget a foundation which agreed to help the institution establish their CALL lab.

In all four institutions the school administration, e.g. head of department is in charge of the budget. The figures indicated for the initial setting up are between $12,000 U.S. and $50,000 U.S. At Turkish Universities there is not a fixed budget for maintenance. Maintenance costs are drawn from the University budget or the budget of the Computer Center. There are not any external sources of funding. Three institutions which are not state universities have their own university

foundation. The other institution had support from the foundation only at the setting up stage.

Staffing

Table 4 provides responses to Q10 and Q11. These questions are about staffing issues: how many staff are responsible only for the CALL lab and what are their responsibilities.

Table 4

Staffing Issues

Institution	Number of Lab Staff	Responsibilities
A	three instructors	daily troubleshooting, monitoring students, basic maintenance, developing materials, design syllabus
B	student workers, two instructors	daily troubleshooting, monitoring students, basic maintenance, developing materials, design syllabus
C	two instructors for each of the two CALL labs	locating various applications on the Internet
D	two officers	identifying students' problem areas helping students in how to use the lab effectively, preparing new exercises, loading exercises into the computers , using authoring software to create new materials.

Usually two or three instructors are enough for the CALL lab as staff, one of the institutions also hires student workers. In Turkish institutions, responsibilities of staff include basic maintenance, daily troubleshooting, developing materials and designing the syllabus. Student workers monitor the students and take care of the material.

Training

Table 5 provides responses to Q 12, Q13, Q16, Q17 and Q21. These questions are about the training of staff, teachers and students.

Table 5

Training Issues

Institution	Training Staff	Training Teachers	Training students
A	no separate training program	in class guidance from the staff	class visits to the lab, brochures
B	orientation , e-mail, World Wide Web, sharing past experiences	pre service training at the beginning of the year	training from the teacher, word processing, e-mail
C	two day workshop	workshop in orientation, occasional meetings, exchange of ideas ,trial and error	class visit to the lab, a short demo, brochures
D	experienced staff help others	briefing ,help from experienced staff	in class training

There are no separate training programs other than short workshops. The training of staff usually takes place in the form of taking guidance from experienced teachers. Training of teachers takes place in the form of workshops and briefings, otherwise teachers take help from each other and more experienced staff. Students are trained by means of class visits to the lab, brochures, and in-class guidance from the class teachers.

Working hours

Table 6 provides responses to Q14, Q18, Q19, Q20, Q22 and Q23. These questions are about the working hours of the CALL lab, how many hours a week is the lab used for class access and individual use of students and the adequacy of the time allocated to individual use of students.

Table 6

Working Hours of the CALL Lab

Institution	General Open Hours	Class Access Hours	Individual Use of Students	Adequacy of Time
A	9 AM to 5 PM	as part of the teaching curriculum	Students can use the lab independently during their time out of class.	not adequate
B	9 AM to 9 PM 10 AM to 6 PM. at the weekend	For listening. all classes have to use the lab.	At least 2 hours a week required from the students with credit	adequate
C	9 AM to 2:30 PM for classes, 2:30 to 5PM for self access	Until 2 30, the classes come regularly. both for class access and self access	students use the call lab independently	adequate
D	3-4 hours a day	1st and 2nd year students	no independent use by students is allowed	not adequate

The lab can be used for classes from 3-4 hours to 12 hours. Only one of the institutions gives credit for lab work and requires the students to spend at least 2 hours a week studying at the CALL lab. In other institutions students go to the CALL lab voluntarily when they need to. Except for one institution students can use the CALL lab individually.

In all institutions, all classes which are scheduled appropriately can use the lab. Also class size should be appropriate so that each student can use one computer or one headphone. Those instructors who feel comfortable with computers also prefer to go to the CALL lab with their classes.

In three of the institutions, the lab is mainly open for individual use of students, but it is also used by classes if needed. A specific amount of time for each

type of use could not be given. In the other institution the lab is mainly used by instructors with their classes one hour a week. In three institutions, the lab is open for individual use of students whenever it is not arranged for class use.

Maintenance

In all institutions, basic maintenance is done by the staff, for bigger problems they can either call the computer center of the institution or the computer company which has installed the computers. All of the four CALL labs are fairly new therefore they have stated that they have not had major problems as yet.

Selection of Equipment

Table 7 provides responses to Q26, Q27, Q28, Q29 and Q30. These questions are related to the selection of hardware and software for the lab, number of computers at the lab, if the computers are networked or stand-alone and the adequacy of the equipment at the lab.

Table 7

Selection of Hardware and Software

Institution	Hardware, Software Selection	Number of Computers, networks	Adequacy of Equipment
A	hardware, software-through catalogues	10 networked	need improvement
B	hardware, by the director of the lab-software by teachers	20 stand alone e-mail, Internet connection	software not adequate
C	hardware, by computer center - software according to needs of students	20 stand alone	computers need updating
D	hardware, from among offers by computer companies- software, recent catalogues	one main computer connected to student headphones e-mail, Internet connection	adequate

Usually the hardware is selected by using commercial catalogues, otherwise computer companies offer choices to select from. Usually, teachers decide which

software to purchase by looking at software catalogues. Teachers also consider students' needs when they are doing this. There are usually 10 to 20 computers in each CALL lab. All comments indicate that there is need for upgrading the CALL lab in terms of both hardware and software.

Plans for the Future

Table 8 provides responses to Q 31 on the interview. This question is about the plans for future changes for the CALL lab.

Table 8

Plans for the Future

Institution	Plans
A	a separate writing lab, updating computers, installing all software they have on the computers
B	updating computers, recording facilities to the computers, a more updated version of software, more lab work within the curriculum
C	more exercises, more software
D	a software library in the lab, a lab with TOEFL practice material, extra software PCs with multimedia capacity for all students, longer working hours in the lab.

The responses indicate that all interviewees have upgrading the lab and providing a larger variety of software in their future plans. Longer working hours is another common plan.

Table 9 provides responses to Q32 which is about the disappointments of CALL lab staff and administrations about the setting up of the CALL lab.

Table 9

Disappointments About the Setting up

Institution	Disappointments
A	cold not find a tried lab system
B	no demo discs to test (from abroad)
C	lack of more modern computers
D	need another lab system with student PCs

All respondents have somewhat different disappointments in respect to their CALL labs. The disappointments usually involve shortcomings in the hardware.

Responses of Administrators of International CALL Labs

Decision Making for the CALL lab

Table 10 provides responses to Q1 and Q2 which deal with identification of decision makers for the CALL labs in international institutions and how these decision makers are determined.

Table 10

Decision Makers and Their Determination in International Institutions

Universities	Decision Makers	Determination
Michigan State	director of the Language Learning Center a committee of language faculty members.	a director was appointed by the Dean of the College of Arts and Letters.
Oregon State	Individualized Learning Task Force (IDLTF) interested teachers. a person who coordinated the use of three separate labs	by the task force.
Albany	foreign language departments technology in education specialists in the School of Education	education specialists

The decision makers are usually directors of the language learning center and foreign language departments. In other institutions task forces and committees are formed. The decision makers are determined by education specialists, a task force, or a Dean.

Skill Areas

Table 11 provides responses to Q3 and Q4 which are about the skill areas the CALL lab was intended for and the rationale for this decision.

Table 11

Skill Areas and Rationale for Skill Areas

Universities	Skill Areas	Rationale
Michigan State	all second language classes for all skill areas.	by individual instructors.
Oregon State	provide an individualized learning setting for students provide TOEFL practice.	decided by asking students about their goals each term IDLTF teachers used their professional judgment
Albany	research in second language acquisition through media Secondarily for service to the undergraduate language learner population	according to the needs of participating parties.

CALL labs are designed to assist students in all four language skills, to give TOEFL practice, and to provide an individualized learning setting. All institutions have different aims in designing CALL labs.

Skill areas are decided by instructors according to students' needs.

Budgets

Table 12 provides responses to Q5, Q6, Q7, Q8 and Q9 which are about the budgeting issues of the CALL lab: sources of budgets for the international institutions, administration of budget, approximate budget for the setting up, external sources of funding and maintenance budget.

Table 12

Budget Issues

Universities	Source	Control	Initial Budget	Maintenance Budget	External sources
Michigan State	Computer Center and College of Arts and Letters	director of the Center	Initially $160,000 U.S.	could not give a figure for maintenance.	does not receive any external funding.
Oregon State	by internal sources of the university.	director of the Center	$ 43,000 U.S.	$5000- 8000 $4500 of this is a maintenance contract	receives occasional grants
Albany	by institutional support through an external fund drive parents as the chief contributors School of Education grant moneys	director of the Center	Approximately $1/ 2 million U.S.	$1500	grant monies from various research projects

The budget for the setting up is usually supplied by internal sources of the university, support is also taken from parents and Schools of Education. The budget is administered by the director of the center. $43,000 US to $½ million US has been spent for the setting up of CALL labs. $ 1500 to $8000 is spent for maintenance.

Two of the international institutions receive external sources of funding.

Staffing

Table 13 provides responses to Q10 and Q11 which are about staffing issues: the number of staff responsible for the CALL lab and their responsibilities.

Table 13

Staffing Issues

Universities	Number of Staff	Responsibilities
Michigan State	two full time staff, student workers	Learning Center (LC) Manager: day-to-day operation of the lab
Oregon State	¾ time lab manager, a ¼- ½ time computer technician, 6-10 student workers	computer technician: installing new software, keeping the network running smoothly, major computer issues. Student workers: lab assistants, check out materials, help students, keep the lab clean, prepare new material, other routine tasks.
Albany	instructors share the responsibility, graduate student workers	graduate students: faculty services and research projects staff- administration: -software purchase and training faculty

All institutions have CALL lab staff and student workers in the CALL lab. There are different kinds of staff, technicians, student workers and managers of the learning center. These people have different responsibilities according to their expertise.

Training

Table 14 provides responses to Q12, Q13, Q16, Q17 and Q21. These questions are about the training of staff, teachers and students.

Table 14

Training Issues

Universities	Training Staff	Teachers	Students
Michigan State	workshops, special sessions and professional conferences	voluntary training sessions each week for instructors	orientation session, beginning of the term demonstration followed by hands-on practice
Oregon State	student workers :several days of familiarization with LC (Learning Center) procedures, equipment, and material	meetings at least once per term in the LC , group discussions one or two workshops, beginning of the term.	introduction to word-processing and the Internet at the beginning of term. IDL (Individual Learning) class 3 hours at the beginning of the term orienting students to the LC and to the idea of self-directed learning.
Albany	ongoing undergraduate workers: simple mechanical operations Graduate Assistants: ongoing training in multimedia design and research through course-work and group projects.	informal training on their needs from experienced staff members	class visits to the lab

Other than workshops and special sessions the training of staff takes place in an ongoing way. Teachers receive informal training in the form of meetings, group discussions and workshops. Experienced staff members also help with the teacher training. Students receive initial training via class visits to the lab during the orientation program of the university; this training goes on as in-class guidance from teachers.

Working Hours

Table 15 provides responses to Q14, Q18, Q20, Q22 and Q23 which are about the working hours of the CALL lab.

Table 15

Working Hours of the CALL Lab

Universities	General open hours	Instructors	Class access hours	Individual use of students	Adequacy of time
Michigan State	8 am to 9:45 pm. On weekdays, Saturdays, from 10 am. to 4:45 pm.: Sundays, open from noon to 9:45 pm;, closed on holidays and between semesters	voluntary use by instructors	one hour a week and this is 20% of their overall time with the class	at least 5 hours a day	immediately before final exams there is a rush as everyone tries to prepare for exams and finish assignments
Oregon State	8 am to 8pm on Monday, from 8 am to 6 pm on Friday, 1pm to 6 pm on Sunday	writing teachers, one hour per week in the Learning Center. Individualized Directed Learning (IDL) course per section/level each with a teacher as a facilitator (a total of 10), two computer courses per term (an introduction to business uses class and either an Internet class or an advanced computer uses class).	35 hours per week with their classes. One of 6 hours per week in writing classes, 3 of 3 hours per week in IDL class and 3 of 3 hours Per week in computer classes is allocated to lab study.	The lab is used for both class and individual use	they vary the open hours to meet demand if necessary.
Albany	9 am. to 9 pm.	1/3 of the faculty use the CALL lab with their classes. Instructors interested and invested in the use of technology in language instruction.	by whole classes from 15 - 20 hours per week.	Open for individual use of students for 60 hours a week	time devoted to individual study is enough.

Instructors use the CALL lab with their classes depending on what class they are teaching, e.g. writing. Except for one institution the CALL lab is used frequently

by whole classes for 15 to 35 hours a week. In all three universities students use the CALL lab independently, if the lab is not reserved for a class. In all three institutions the lab is used for individual study by students. All institutions find the CALL lab time adequate for student requests except for periods when there is a high demand from students e.g. before exams.

Maintenance

Table 16 provides responses to Q25 on the interview which is about the maintenance of the CALL lab.

Table 16

Maintenance

Universities	Responsible people
Michigan State	computer center, Student workers
Oregon State	Lab Manager, Computer Center computer technician deals with software and network issues
Albany	Graduate assistants

Except for one institution, the computer center is responsible for the maintenance of the CALL lab. In one of the institutions maintenance is done by graduate assistants.

Selection of Equipment

Table 17 provides responses to Q26, 27, 28, 29 and 30

Table 17

Selection of Hardware and Software

Universities	Hardware and software selection	Number of computers, networks	Adequacy of Equipment
Michigan State	by the committee with faculty members and staff the hardware was selected from the Computer Center, the software was selected according to requests by the faculty	29 networked and they also have access to the Internet.	Adequate
Oregon State	The Task Force selected the hardware software was selected initially by the Task Force then later by teacher requests.	20 networked but most of the software is run locally rather than from a server.	Adequate
Albany	according to needs	14 networked for Internet access	Adequate

Needs of students and teacher requests are used in the selection of software. A committee or task force selects the software according to the needs of students and requests from the teachers. There are 14 to 29 computers at the CALL labs. Two of the CALL labs have computers networked to each other within the lab. All CALL labs are connected to the Internet.

Plans for the Future

Table 18 provides responses to Q31 which is about the future plans of the administrators for the development of the CALL lab.

Table 18

Plans for the Future

Universities	Plans
Michigan State	opening a new lab with 20 more computers.
Oregon State	get bigger hard drives and more memory for the computers and are upgrading the computers.
Albany	replace analog audio and video stations with digital ones.

Plans for the future include opening a new CALL lab and updating the existing computers.

Table 19 provides responses to Q32 which is about the disappointments of administrators about the setting up of the CALL lab.

Table 19

Disappointments About Setting up

Universities	Disappointments
Michigan State	did not provide details
Oregon State	they would buy what they had now rather than starting with drill and practice.
Albany	would have gone with a different analog audio/video vendor if they were to start again.

The disappointments are usually about the hardware for the two institutions who commented on this item. They state that they would prefer to obtain modern equipment from the beginning.

Responses of Administrators to the Rating Question

Administrators have to deal with a number of design issues during the initial stages of setting up a CALL lab in their institution. It is possible to face difficulties when dealing with these design issues.

Q32. Asked administrators to rate design issues from 1: to the most problematic to 5: the least problematic to handle in the initial stages of establishment of their CALL lab. Table 20 provides means and standard deviations.

Table 20

Opinions of Administrators and CALL lab Staff on the Degree of Importance of Design Issues of CALL labs

Items	National		International		Total	
	M	SD	M	SD	M	SD
n	8		3		11	
1. finding adequate budget	3.37	1.68	3.25	1.38	3.54	1.50
2.Scheduling for use	3.25	1.38	4	1	3.45	1.29
3. Choosing staff	3.37	1.59	3.33	1.15	3.36	1.43
4. Training staff	2.75	1.48	3.66	0.57	3	1.34
5. Training teachers	3	1.06	2.33	0.57	2.81	0.98
6. Training students	3.5	1.41	3.66	1.52	3.45	1.36
7. Selecting hardware	2.75	1.16	4.33	0.57	3.18	1.25
8. Selecting software	3	1.77	4.33	0.57	3.36	1.62
9. Maintaining facility	3.62	1.06	3	0	3.45	0.93
10. Establishing links with users	2.87	1.35	3.33	0.57	3	1.18
11. Obtaining appropriate space and location	4.12	1.12	4.33	1.15	4.18	1.07

1= most problematic.....5= least problematic

Question 32 on the administrator interview was designed to find out about the problems that administrators and CALL lab staff faced in respect to the design issues. 11 issues were listed and the administrators and CALL lab staff who were involved in the setting up process were asked to rate these issues from 1: the most problematic to 5: the least problematic. According to the responses obtained, the most problematic issue was training teachers (M= 2.81), training staff (M= 3) and establishing links with users followed (M= 3). The fourth issue was choosing staff (M= 3.36) and the fifth most problematic issues were training students (M=3.45). maintaining facility (M= 3.45) and scheduling for use (M= 3.45). Finding adequate budget (M=3.54) was the sixth issue and the least problematic issue was obtaining space and location (M= 4.18).

There is a significant difference between the opinion of national and international interviewees about the selection of hardware. Turkish interviewees find it problematic to select hardware (M=2.75, SD=1.16) but foreign interviewees do not find it very problematic (M=4.33, SD=0.57). The difference is significant at level $p<.02$. Another item on which there is a significant difference is the selection of software. Turkish interviewees find it somewhat problematic to select software (M=3, SD=1.77), but foreign interviewees do not find this issue very problematic (M=4.33, SD=0.57). This may be due to the high availability of hardware and software in the U.S., the variety of choices may be helpful for the administrators in choosing the best material for their institution, but in Turkey although there is a variety of hardware to choose from, it is very expensive and the availability of good language teaching software is low. Teachers have to order their material from abroad.

Responses of Administrators to the Ranking Question

Q33 asked administrators to suggest an ideal sequence for design issues.

Table 21

Rankings of National and International Administrators and CALL lab Staff for the Design Issues.

	Total national rank	Total international rank	Total rank
n	n= 8	n= 3	n=11
Items			
1. finding adequate budget	1.12	2	1.56
2. scheduling for use	9.25	5	7.12
3. choosing staff	4.8	6.3	5.55
4. training staff	6.3	6	6.15
5. training teachers	6.8	6.3	6.55
6. training students	7	1	4
7. selecting hardware	3.12	7	5.06
8. selecting software	4.87	6.6	5.73
9. maintaining facility	7.62	7.3	7.46
10. establishing links with users	8.6	9.6	9.1
11. obtaining appropriate space and location	6	8.3	715

The average rankings were obtained by taking the means of ranks provided for each item by the respondents. Kendall's W Coefficient of Concordance was employed in order to find the degree of agreement between national administrators and staff on the sequencing of design issues. For the national sampling, x^2 value was

found to be 41.49 which is highly significant at level $p<.001$. It can be concluded from this value that there is a strong agreement between the national administrators and CALL lab staff on the sequence of critical design issues in the setting up process of the CALL lab. For the international sampling x^2 value was found to be 13.98 which is not significant. There is little agreement on the sequence of items by international administrators.

National administrators and staff sequenced the design issues in the following way: 1.finding adequate budget, 2.selecting hardware, 3.choosing staff - selecting software, 4.obtaining appropriate space and location, 5.training staff, 6.training teachers, 7. training students, 8.maintaining facility, 9.establishing links with users, 10.scheduling for use.

International interviewees sequenced the design issues in the following way: 1. training students, 2. Finding adequate budget, 3. Scheduling for use, 4. training staff, 5. choosing staff- training teachers, 6. Selecting software, 7. Selecting hardware, 8. maintaining facility, 9. Obtaining appropriate space and location, 10. Establishing links with users.

The combined ranking obtained was as follows: 1. Finding adequate budget, 2. Training students, 3. Selecting hardware, 4. Choosing staff, 5. Selecting software, 6. Training staff, 7. Scheduling for use, 8. Obtaining appropriate space and location, 9. Maintaining facility, 10. Establishing links with users,

Results of the Student Questionnaire

Two groups of students were chosen from each university according to their level of proficiency in English as a representative sample of the users of the CALL labs in Turkey. The chosen levels were intermediate and upper intermediate. At Bilkent University, thirty intermediate and twenty four upper intermediate students were given questionnaires. At Koç University, eleven intermediate and ten upper intermediate students were given questionnaires.

The tables below refer to each section of the questionnaire in order of presentation. The content of each question is included prior to the data tables and the table is followed by discussion relevant to the student responses.

Questionnaire Section A

Student Opinions about CALL labs in general

Q1. How necessary it is according to you to have a CALL lab in a language teaching institution?

Q2. How effective has the CALL lab been on your learning a second language?

Means and standard deviations of student responses related to attitudes about the CALL lab.

Table 22

Means and Standard Deviations of Students' Rating Responses Related to Their Attitudes Towards CALL labs

			Question 1	Question 2
Institution	Level	n	M. SD.	M. SD.
Koç	intermediate	11	4.90 (0.30)	4.45 (0.52)
	up-intermediate	10	4.70 (0.48)	2.70 (1.15)
Bilkent	intermediate	30	4.46 (0.81)	3.20 (1.27)
	up-intermediate	24	4.29 (1.23)	3.37 (1.27)
Total		75	4.55 (0.82)	3.40 (1.23)

Note. Q1. 1-not at all necessary, 2-not so necessary, 3-do not care, 4- necessary, 5-very necessary

Q2. 1-not at all effective, 2-not so effective, 3-neutral, 4-effective, 5-very effective

The first two questions inquired about the opinion of students on the necessity of having a CALL lab in a language teaching institution. The means and standard deviations of students' responses to the first and second questions are presented in Table 22. According to the data obtained for the first question, all students agreed on

the critical necessity of having a CALL lab in a language teaching institution (M = 4.55). According to the data obtained for the second question, it was found that all students except upper intermediate Koç students (M=2.7) agreed that the CALL lab in their institution has been effective (Total M= 3.40) on their learning a second language.

T-tests were done in order to find out if there are significant differences between students' responses. For the first question, there were no significant differences between the students responses. For the second question there is a significant difference between intermediate Koç students (M=4.45, SD=0.52) and intermediate Bilkent students (M=3.2, SD=1.27). The difference was found to be significant at $p<.001$. This suggests that Koç University intermediate students agree with the statement that the CALL lab in their institution has been effective on their learning a second language whereas intermediate Bilkent students cannot state a clear opinion on this issue. Upper intermediate students from both Koç and Bilkent appear uncertain as to the effectiveness of the CALL lab. However, the mean of responses of Koç students are more positive than those of Bilkent students. That means that, students feel the CALL facility important but it has not lived up to its potential or their expectations as yet. This opinion is particularly striking in Koc upper intermediate students.

Questions Related to Students' Use of the CALL lab

Q 3. For which skill areas do you use the CALL lab most frequently ?

Students were asked to rank order the four skills: reading, writing, listening

and speaking as to their frequency of use in the CALL lab.

Table 23 summarizes responses to Question 3.

Table 23

Means and Standard Deviations of Student Ranking of Skill Use of the CALL Lab

			reading	writing	listening	speaking
institution	level	n	M. SD.	M. SD.	M. SD.	M. SD.
Koç	int.	11	2.45 (1.12)	2.54 (1.12)	3.36 (1.20)	2.18 (1.16)
	up-int.	10	2.3 (0.67)	2.5 (1.08)	3 (1.24)	1.9 (1.28)
Bilkent	int.	30	3.46 (0.81)	3.06 (0.90)	1.83 (0.83)	1.4 (0.62)
	up-int.	24	3.12 (0.94)	2.79 (1.10)	2.12 (1.03)	1.95 (1.04)
Total		75	3.04 (0.98)	2.82 (1.03)	2.28 (1.16)	1.78 (0.98)

Note. 1=least frequently used, 4=most frequently used

Question 3 asked about students' personal use of the CALL lab in terms of skill areas. In the two different universities; Bilkent and Koç, students' use of the CALL lab differs. In Koç University, the lab is mostly used for listening (M:3.36, SD:1.20), the second most used skill is writing (M:2.54, SD: 1.12). Reading (M: 2.45, SD: 1.12) and speaking (M:2.18, SD:1.16) follow in order of frequency of usage. The most significant difference between the two universities for this item is for the skill of listening, relating to design differences between the two CALL labs. It can be observed from the total means and standard deviations that Bilkent students use the CALL lab mostly for practicing reading skills (M= 3.04, SD.=0.98). The second most frequent use of the lab is for practicing writing skills (M =2.82, SD.=1.03). Thirdly, students use the lab for practicing listening skills (M=2.28,

SD.=1.16). Students rarely use the CALL lab for practicing speaking skills (M=1.78, SD.=0.98).

Significant differences were observed in respect to the students' use of the CALL lab in Koç and Bilkent. The most significant differences were observed for the skill of listening. The difference between intermediate students' responses regarding the skill of listening is highly significant at level $p<.001$. The differences suggest that Bilkent students do not use the CALL lab for listening whereas this skill is emphasized at Koç University.

It was observed from the data obtained that intermediate Bilkent students (M=3.46, SD= 0.81) use the CALL lab for reading more than intermediate Koç students (M=2.45, SD=1.12). The difference was found significant at level .01 ($p<.01$). Upper intermediate Bilkent students (M=3.12, SD=0.94) also use the CALL lab for reading more than upper intermediate Koç students do (M=2.3, SD=0.67).

No significant differences were observed for the skill of writing. This skill has an intermediate emphasis at both of the CALL labs.

Q4. How do you use the CALL lab ?

Question 4 in the first section of the questionnaire aimed at determining how students used the CALL lab; independently or with their class. The data obtained from question four is presented in the form of frequencies and percentages in Table 24.

Table 24

Frequencies and Percentages of Student Responses Relating to Students' Class/ Individual Use of the CALL Lab

Question 4					
Institution	Level	n	a independently	b with my class	c both
Koç	intermediate	11	1 (9.09%)	1 (0.09%)	9 (81.8%)
	upper-int.	10	3 (30%)	----------	7 (70%)
Bilkent	intermediate	30	5 (16.6%)	16 (53.3%)	9 (30%)
	upper-int.	24	1 (4.16%)	14 (58.3%)	9 (37.5%)
Total		75	10 (13.3%)	31 (41.3%)	34 (45.3%)

The total means show that 45.3% of all the students use the lab both individually and with their class, whereas 41.3% use the CALL lab only with their classes and 13.3 % of the students use the lab individually only.

Q5. How many hours a week do you use the CALL lab with your class?

Q6. How many hours do you use the CALL lab independently?

Questions 5 and 6 inquire about how much time students spend in the CALL lab weekly. According to the students responses to questions 5 and 6, students use the CALL lab for 0-1 hour independently, and for 2-4 hours with their class weekly.

Q7. What do you use the CALL lab for when you use it independently?

Table 25

Means and Standard Deviations of Student Responses Relating to Students' Purposes in Independent Use of the CALL Lab

	Koç				Bilkent				Total	
	int.		up. int.		int.		up. int.			
	M	SD	M	SD	M	SD	M	SD	M	SD
a. to practice a language point	1.63	0.67	2.9	0.99	3.13	1.02	2.37	1.34	2.63	1.21
b. to get ready for an exam	2	0.77	2.3	0.94	2.9	1.37	2.54	1.17	2.55	1.21
c. to develop vocabulary	1.72	0.78	2.8	1.03	3.13	1.05	2.87	0.99	2.78	1.08
d. for enjoyment	3.45	0.82	2.7	0.94	1.53	0.80	1.66	0.76	2.02	1.07
e. to pass time	4.18	0.75	2.8	1.31	1.53	0.76	1.29	0.55	2.02	1.29

Note 1=never, 2= rarely, 3= sometimes, 4= often, 5=very often

Question 7 aimed at finding out what students used the CALL lab for when they used it independently. It can be observed from the means and standard deviations of students' responses that students use the CALL lab mostly to develop their vocabulary (M= 2.55), secondly students use the lab to practice a language point (M= 2.63), the next use is to get ready for an exam. Overall, students rarely go to the lab for enjoyment (M= 2.02) or to pass time (M= 2.02).

Intermediate Koç students (M=1.63, SD=0.67) stated that they rarely use the CALL lab to practice a language point, but intermediate Bilkent students sometimes

use the CALL lab for this purpose. A significant difference at level p<.001was observed between the two intermediate groups.

Intermediate Koç students (M=1.72, SD=0.78) rarely use the CALL lab to develop their vocabulary, but intermediate Bilkent students (M=3.13, SD=1.05) sometimes use the CALL lab for this purpose. The difference between the responses of the intermediate groups is significant at level p<.001.

Intermediate Bilkent students rarely spend time for enjoyment at the CALL lab (M=1.53, SD=0.80) whereas intermediate Koç students sometimes do (M=3.45, SD=0.82). The difference is significant at level p<.001. Intermediate Bilkent students rarely go to the CALL lab to pass time (M=1.53, SD=0.76), but intermediate Koc students often do (M=4.18, SD=0.75). The difference is significant at level p<.001.

Upper intermediate Koc students go to the CALL lab for enjoyment more than upper intermediate Bilkent students do. The responses to this item differ significantly between the two groups of students at level p<.01. Upper intermediate Koç students sometimes go to the CALL lab to pass time (M=2.8, SD=1.31) whereas upper intermediate Bilkent students rarely do (M=1.29, SD=0.55). The difference is significant at p<.01.

Intermediate Koç students sometimes go to the CALL lab for enjoyment and often go to the CALL lab to pass time. This may be because they are students new to the university for whom the CALL lab is a novelty, or they may truly see the CALL lab as user friendly and a place they like to be given a choice of other alternatives.

Questionnaire Section B: Students' Likes and Dislikes About the CALL lab

In this section of the questionnaire students were asked open ended questions concerning their likes and dislikes about the CALL lab. In this section the codes given to the two institutions in the preceding section are used when referring to these institutions. Student responses were categorized under the following headings and then summarized. Each statement does not represent only one student response. The headings are: general opinions about the CALL lab, opinions about the computers, opinions about the software.

Things Students Like Most About the CALL lab.

General Opinions About the CALL lab

Table 26 summarizes the open ended responses of students form institution B and institution C in respect to what they like most about the CALL lab

Table 26

Students' Likes About the CALL lab

Institution B	Institution C
They can use the e-mail at the CALL lab to write to people in other countries and hold discussions.(3)	The CALL lab is tidy and quiet. (2)
The CALL lab has a comfortable environment and that it meets their expectations. (2)	It helps them to learn. (3)
It is modern.(3)	They like to do independent study at the CALL lab. (2)
It is open most of the time. (1)	It is not boring. (2)
It is useful for practicing language points. (4)	They can do language practice. (3)

note: Numbers in parentheses ( ) represent number of responses.

As can be observed from Table 26, users of CALL labs from both institutions think that the CALL lab is useful for doing language practice.

Opinions About Computers

Table 27

Students' Likes About the Computers

Institution B	Institution C
The computer makes studying enjoyable. (2)	The computer checks their responses. (1)
They can control the computer as they wish. (1)	The computer provides answer keys. (1)
They like working with the computer.(2)	They do not have to use pen and paper. (1)
	They can correct their mistakes with the help of the computer. (2)
	They can repeat and stop when they want.(1)
	They also like working with computer because they learn how to use the computer itself. (2)

note: Numbers in parentheses ( ) represent number of responses.

According to student responses concerning what they like about the computers, it was observed that the capacities of the computer for error correction, the flexibility it provides as a word processor and the fact that it can be controlled by the user affects users positively.

Table 28

Students' Likes About the Software

Institution B	Institution C
Listening programs. (4)	Exam preparation programs. (4)
Language practice programs. (3)	Vocabulary building programs. (3)
Pronunciation and writing programs. (3)	Preposition programs. (1)
Games. (2)	Games. (2)
	Exercises that are loaded on the computer. (3)
	Writing programs(2)
	They also think that the software is useful in general. (2)

note: Numbers in parentheses ( ) represent number of responses.

Users of CALL labs from both institutions like computer games and software focusing on language practice. There are different kinds of software in the two labs for this reason different opinions were also observed especially in terms of listening programs. It is obvious that users in institution B like software focusing on listening

skills whereas users in institution C stated that they like writing programs and exam preparation programs.

Things Students do not Like About the CALL lab:

Table 29

Students' Dislikes About the CALL lab

Institution B	Institution C
The CALL lab is very crowded. (2)	They can not spend enough time at the CALL lab.(3)
Sometimes the number of computers is not enough. (3)	It is sometimes boring to study at the CALL lab.(2)
There is noise. (2)	The CALL lab is sometimes noisy.(3)
When a problem occurs while working, it is a waste of time. (3)	It is not attractive enough to go after lessons finish. (2)
Sometimes the system does not work. (1)	

note: Numbers in parentheses ( ) represent number of responses.

It can be observed from Table 29 that users dislikes about the computer lab focus on technical problems and inadequacy of time and equipment. Management of the CALL lab, e.g. noise, crowd also effects users opinions towards the CALL lab. Maintenance is also an important factor which effects user opinions about the CALL lab.

Table 30

Students' Dislikes About the Computer

Institution B	Institution C
The machines often break down. (4)	The computers are slow. (4)
Some computers at the lab do not work. (2)	They often break down. (3)
They sometimes have a headache when they use the computers for a long time.(3)	There are technical problems.(2)
	Computers are old.(4)
	They are sometimes boring. (2)

note: Numbers in parentheses ( ) represent number of responses.

It can be observed from Table 30 that what students do not like about the computer itself is technical problems that can occur The age of the equipment also has a negative effect on user opinions.

Table 31

Students' Dislikes About the Software

Institution B	Institution C
Some facilities are lacking in the software, for example students would like to enter the dictionary with one button. (1)	The software is old and boring. (3)
	There is not enough software. (2)
	It is boring to see the same programs all the time. (1)
	They can not find the meaning of unknown words.(3)

note: Numbers in parentheses ( ) represent number of responses.

As observed from table 31, it seems that lack of variety of software is the most important factor that effects user opinions negatively towards the software. Age of equipment and interest are other factors that effect user opinions.

Questionnaire Section C

Table 32

Specific Opinions About the Existing CALL lab in Institution

	Items		1	2	3	4	5	6	7	8	9	10	11	12	13
Institution		n	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.
			SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.
BILKENT	int.	30	3.3	3.5	3.2	3.3	3.1	3.13	3.43	3.36	2.9	3.06	2.23	2.9	3.4
			1.60	1.45	1.15	1.17	1.21	1.45	1.16	1.24	1.18	1.52	1.04	1.37	1.49
	up.int.	24	3.16	3.16	2.5	2.79	2.79	3.66	3.79	3.54	3.79	3.62	3.04	3.62	4.04
			1.40	1.40	1.35	1.21	1.47	1.23	1.17	1.44	1.35	1.37	1.33	1.17	1.36
KOÇ	int.	11	2.18	2.45	2.90	2.54	2.45	2.36	2.54	2.27	2.09	2.45	2	3	3.27
			0.75	0.82	1.22	0.68	0.52	0.50	0.82	1	0.94	0.52	0.89	1.18	0.90
	up.int.	10	3.4	3.2	2.6	2.5	3.6	3.7	3.5	3.4	3.2	3.4	4	3.5	4
			0.69	1.31	0.96	0.86	0.96	1.05	0.84	1.17	1.03	1.34	1.15	1.17	0.81
Total		75	3.13	3.22	2.87	2.97	3	3.27	3.44	3.43	3.18	3.01	2.83	3.29	3.62
			1.36	1.35	1.22	1.09	1.21	1.29	1.25	1.22	1.20	1.36	1.26	1.38	1.26

Note. 1-strongly disagree, 2-disagree, 3-no opinion, 4-agree, 5-strongly agree

Note.

1. Our CALL lab is scheduled appropriately.
2. There are enough computers at the CALL lab.
3. The software at the CALL lab is satisfactory.
4. The software is interesting and motivating.
5. The lay -out of the CALL lab provides a comfortable learning environment.
6. I enjoy studying at the CALL lab.
7. The CALL lab staff is available when they are needed.
8. The CALL lab staff is adequately trained to use the CALL lab and provide guidance.
9. The teachers are adequately trained to use the CALL lab and provide guidance.
10. As a student I am adequately trained to use the CALL lab and provide guidance to others.
11. The computers break down very often.
12. The maintenance of the CALL lab is a problem.
13. The CALL lab needs updating.

The purpose of the third section of the questionnaire was to find out about students' opinions towards the way their CALL lab was designed and now operates. It can be observed from the student responses that students slightly agree that the CALL lab in their institution is scheduled appropriately (M= 3.13). Students also slightly agree that there are enough computers in the CALL lab (M= 3.22). The students are neutral about the lay-out of the CALL lab (M=3) and the training they received to study at the CALL lab (M= 3.01). Students slightly agree that it is enjoyable to study in the CALL lab (M= 3.27) and that the availability of the CALL

lab staff is high (M= 3.44). Other slightly agreed upon points are adequate training of staff (M= 3.43) and training of teachers (M= 3.18). Students also think that the maintenance of the CALL lab is a problem (M= 3.29) and that the CALL lab needs updating (M= 3.62). Students disagree that the software at the CALL lab is adequate (M= 2.87) and interesting (M= 2.97). The students do not agree on the point that the computers break down very often (M= 2.83).

About the scheduling of the CALL labs, there is a significant difference between intermediate Bilkent students' and Koç students' opinions. Intermediate Bilkent students are uncertain about this issue (M=3.3, SD=1.60) and intermediate Koç students disagree with the statement that the CALL lab is scheduled appropriately (M=2.18, SD=0.75).

Another item on which there is a significant difference is the number of computers. Intermediate Koç students do not find the number of computers at the CALL lab adequate (M=2.45, SD=0.82) while intermediate Bilkent students agree slightly that there are (M=3.5, SD=1.45). The difference is significant at level $p < .01$.

About the software, responses of intermediate Bilkent and Koç students differ significantly, with Koç students more satisfied with the software than Bilkent students.

About the lay out there is a significant difference of responses at level .01. Koç students (M=2.36, SD=0.50) do not think that the CALL lab provides a comfortable learning environment. Bilkent students are neutral on this item (M=3.1, SD=1.21). Upper intermediate Koç students agree with the statement that the layout of their CALL lab provides a comfortable learning environment (M=3.6, SD=0.96)

whereas upper intermediate Bilkent students are uncertain about this issue (M=2.79, SD=1.47).

The sixth item inquires if students enjoy studying at the CALL lab or not. Intermediate Koc students say that they enjoy studying at the CALL lab (M=2.36, SD=0.50). Intermediate Bilkent students are neutral on this item (M= 3.13, SD=1.45). The difference between the two groups is significant at level p<.02.

Intermediate Bilkent students are neutral on the statement that CALL lab staff are available when needed (M=3.43, SD=1.16). Intermediate Koç students slightly disagree with this statement (M=2.54, SD=0.82). The difference is significant at level p<.02.

Intermediate Bilkent students are uncertain as to the adequacy of training of the CALL lab staff (M=3.36, SD=1.24) whereas intermediate Koc students find the training of staff inadequate (M=2.27, SD=1). The difference is significant at level p<.02.

About the training of students themselves, intermediate Bilkent students are neutral (M=3.06, SD=1.52), on the other hand, intermediate Koç students disagree with the statement that they are adequately trained for study at the CALL lab. The difference is significant at level p<.05.

Upper intermediate Koc students think that the computers at their CALL lab break down very often (M=4, SD=1.15) but upper intermediate Bilkent students are neutral on this item (M=3.04, SD=1.33). The difference between the two groups is significant at level p<.05.

Questionnaire Section D

Table 33

Student Opinions About Future Changes for the CALL lab

	Items		a	b	c	d	e	f	g	h	i	j
Institution	Level	n	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.
			SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.	SD.
Bilkent	int.	30	2.2	2.43	2.06	2.3	2.83	2.2	1.1	1.73	2.53	2.43
			0.66	0.89	0.98	0.87	0.46	0.84	0.92	0.94	0.77	0.72
	up.int	24	1.91	2.33	2.54	2.37	2.41	2.20	1.20	1.87	2.25	2.41
			0.97	0.86	0.65	0.87	0.82	1.02	0.97	1.11	0.79	0.88
Koç	int.	11	2.27	2.63	2.54	2.09	2.18	2	1.81	2.45	2.18	2.36
			0.64	0.50	0.52	0.70	0.98	0.89	0.75	0.68	0.75	0.50
	up.int.	10	2.3	2.3	2.7	2.7	2.5	1.7	1	2	2.5	1.9
			0.82	0.82	0.48	0.67	0.84	0.94	0.94	0.81	0.70	0.56
total		75	2.12	2.40	2.40	2.33	2.5	2.09	1.32	1.89	2.39	2.36
			0.81	0.82	0.75	0.88	0.76	0.92	0.98	0.97	0.77	0.73

Note. 0= Not important, 1=of secondary importance, 2= Important, 3= Very important

a. buying more computers

b. expanding the capacity of existing computers

c. providing multimedia capacity for the computers

d. buying more software

e. connecting the CALL lab to the inter-net

f. using e-mail as a means of instruction

g. hiring more staff

h. training CALL lab staff and teachers more efficiently

i. training students more efficiently

j. increasing the working hours in the CALL lab

The fourth section of the questionnaire aimed at finding out students' opinions about future changes for the CALL lab in their institution. Students were asked to rate design issues from 0 to 3 according to the degree of importance they attached to each. According to students' responses in general, the most important issue to be considered was connecting the CALL lab to the Internet (M= 2.5). The second two issues which were found important by the students were expanding the capacity of existing computers (M= 2.40) and providing multimedia capacity for the computers (M= 2.40). The third important point was training students more efficiently (M= 2.39) and increasing studying hours in the CALL lab (M=2.36). Other issues in order of importance attached are as follows; buying more software (M= 2.33), buying more computers (M= 2.12) and using e-mail as a means of instruction (M= 2.09). On the other hand, secondary importance was attached to hiring more CALL lab staff (M= 1.32) and training teachers and CALL lab staff efficiently (M= 1.89).

There is a significant difference between the responses of intermediate student groups on item h (training CALL lab staff and teachers more efficiently). It is significant at level .01. On item c (providing multimedia capacity for the computers), there is also a significant difference between the intermediate groups. It is significant at level .05.

On item e (connecting the CALL lab to the Internet), intermediate Bilkent students found this issue very important (M=2.83, SD=0.46), whereas intermediate

Koç students found it important (M=2.18, SD=0.98). The difference between the two groups is significant at level .05 ($p<.05$). Hiring more staff is not important for Bilkent students (M=1.1, SD=0.92), but it is of secondary importance for intermediate Koç students (M=1.81, SD=0.75). The difference between the two groups is significant at level .01 ($p<.01$). On item j (increasing working hours at the CALL lab), there is a significant difference between the two upper intermediate groups. The difference is significant at level .05 ($p<.05$).

CHAPTER 5 CONCLUSIONS

Summary of the Study

The main purpose of this study was to provide the administration of Karadeniz Technical University, Postgraduate English Preparation Program with a detailed description of the current state of CALL laboratories in Turkey and internationally. The focus of the study was to define certain design issues which are critical in setting up a CALL lab and to determine how design decisions have been made both nationally and internationally. These data should facilitate decision-making at KTU in respect to the setting up of a CALL lab. In every institution, the needs of students and the goals of the language teaching program are different, for this reason there is not one perfect way of designing a CALL lab. Therefore, a number of CALL labs in Turkey and abroad were surveyed in order to provide a variety of models for KTU.

The national sampling was done through interviews and questionnaires. The interviews were conducted with the administrators of the CALL labs and CALL lab staff in these institutions. Four institutions, namely the Turkish Military Academy, Bilkent University, Koç University and Başkent University, were chosen for the national sampling. In these institutions, administrators and CALL lab staff were interviewed. The questionnaires were given to students attending the English language programs at two Universities in Turkey, namely, Bilkent University and Koç University.

For the international sampling correspondence was conducted through e-mail with CALL experts in charge of the CALL lab in their institutions. Representatives of three institutions in the United States, namely the University at Albany, State

University of New York, Michigan State University and Oregon State University, responded to the interview questions via e-mail.

The main purpose of the interviews was to share the experiences of experts who had been involved in setting up CALL labs and to gain a deeper insight into the critical design issues for setting up a CALL lab. The purpose of the questionnaires was to get the views of the users of the CALL labs.

The responses of interviewees to open ended questions were summarized under general headings. For the national sampling, codes are used to identify the institutions as follows: A: Baþkent University, B: Koç University, C: Bilkent University and D: the Military Academy. The responses to one ranking and one rating question in the interview were compared in tables. For the rating question, means and standard deviations were found and compared. For the ranking question in the administrator interview, the responses were compared across respondents using Kendall's Coefficient of Concordance.

Seventy five students at Bilkent University and Koç University were given questionnaires. The questionnaire given to students consisted of four sections and aimed at obtaining knowledge on students' opinion of CALL, how they use the CALL lab in their institution, their likes and dislikes about the CALL lab in their institution, their attitudes towards the design of the CALL lab in their institution and their opinion on ways of improving the CALL lab in their institution.

The answers of the students to each question in the questionnaire were presented by means of tables showing means and standard deviations or frequencies and percentages according to the nature of the question. To find out whether there are

significant differences between the different groups, T-test comparisons of means were used.

Discussions of Findings and Conclusions

It is not possible to suggest one best answer to the question: " How should one set up an effective CALL lab?". The process of setting up a CALL lab is not a one time activity, it is an ongoing one. This view is relevant to the nature of CALL because this field is a fast changing one (Peters, 1981). Computer technology, hardware and software is always in the process of development, this development effects every field of study which utilizes computers. CALL, being one of these fields, is directly affected by changes in computer technology. With developments in computer technology, critical design factors and decisions surrounding the use of computers may also change. The researcher's aim with this study was not to provide a single model of design for an effective CALL lab. Rather, it was to help decision makers better understand the process of design and decision making by analyzing the varied experiences of CALL labs, nationally and internationally.

The first question was about what the critical design issues in setting up a CALL lab are. The second research question asked how various issues of design were treated in various institutions when setting up their CALL lab. The following conclusions provide some insights into the process of design and decision making.

Decision Making

Various approaches for decision making in CALL are suggested in the literature, such as a centralized approach, a decentralized approach or a shared planning approach. As a result of the interviews in Turkey, it was found that the initial decision for establishing national CALL labs came from the administrators of the institutions reflecting a centralized, top down approach. In foreign institutions, initial decision making is also made in a top down manner, but there were committees, education specialists and task forces involved in the decision making. According to the interviewees, gathering a committee or task force before making initial decisions for the CALL lab is necessary.

Uses of the CALL lab

The uses of computers in language teaching is becoming more and more varied as multimedia capacities of computers develop. In the first years of CALL, listening and speaking lessons with computers were not possible. Today the computer can be used for a great variety of purposes in language teaching.

> What is being tried in education nowadays by means of computers, and what is being accomplished, is entirely different from first generation uses, in terms of underlying pedagogical philosophy as well as in terms of implementations made possible with the increasing technological sophistication of the medium. (Pennington, 1989, p.viii)

Today it is possible to view pictures and simulations on the computer, to listen or to record voices. Today's decision makers have a lot more possibilities to choose

from when setting up a CALL lab than did pioneers in CALL. Although the CALL labs, both nationally and internationally, were established for different purposes, they share some features. All CALL labs include or plan to include all four skills in their software selections. Another common goal is to provide opportunies for student practice. The CALL lab is not necessarily designed for individual study of students. In both national and international institutions, students use the CALL lab both individually and with their class. Only one of the CALL labs in the U.S. is specifically designed for individual learning yet all labs are made available for individual student use. Preparation for university exams and the TOEFL is another goal of the CALL labs. It can be observed from the responses in this section that the uses of the labs are decided according to the needs of users and goals of the language departments in teaching a foreign language.

Budgets

It was found that the required budget for the establishment of a CALL lab is supplied from internal sources in private institutions and from external sources (foundation) in public institutions such as the Turkish Military Academy or governmental sources. In the U.S., public institutions also have enough internal resources in order to establish a CALL lab. In Turkey the approximate initial budget was said to be between 12,000 US $ and 50,000 US $. In the U.S. the initial budget was found to be between 43,000 US $ and ½ million US $. The on-going budgets of the international CALL labs are higher than that of Turkish CALL labs. There are no yearly fixed budgets for maintenance except for the University of Oregon which has

allocated 5,000 US $ to 8,000 US $ for maintenance. The maintenance costs are usually supplied from the budget of the computer center of the institutions.

Staffing

There are usually two or three CALL lab staff who are responsible only for the CALL lab. There is a need for at least one or two people who are always available in the CALL lab for students in case they have problems with the computers. Two of the institutions, one in Turkey have added to staff by hiring student workers.

Responsibilities of Staff

In both national and international CALL labs, staff have the same responsibilities; the day-to-day operation of the CALL lab, daily troubleshooting, administration of the CALL lab, software purchase, training of teachers and students, installing new software, keeping the equipment working and developing materials. In addition, preparing support materials is one of the important responsibilities of the CALL lab staff, as ready made commercial material may not be relevant to the needs and expectations of the students. In this respect, CALL lab staff should be capable of designing and developing materials suitable for the users.

Training

In comparing national and international CALL labs, training is approached differently. Yet, all agree that training should take place in an ongoing way. In international CALL labs, training takes place in the form of workshops, special sessions and professional conferences whereas in national CALL labs training takes

place during the orientation at the beginning of the term. After orientation, new staff learn by getting one-to-one guidance from more experienced staff. Training programs for staff should include instruction about basic technical concerns and maintenance. As modern CALL lab designs include sophisticated networking, it is also necessary to teach staff how to operate and make best use of internal and external networking. What to include in the training program depends on what kind of hardware and software is used in the CALL lab.

Teachers need to know how to switch on the equipment, insert discs correctly, load and run the programs they wish to use. A knowledge of authoring programs is also desirable although few teachers create their own software. Teacher training is done by means of short workshops and group meetings in both national and international institutions. These workshops take place at the beginning of the year and the training goes on in an informal way throughout the year according to the teachers' needs. For students, an orientation takes place at the beginning of each term in order to introduce the CALL lab and how to use it.

Working Hours

All of the CALL labs are open during the week generally from 9AM to 5 PM. Some of them are also open on the weekends. Administrators state that it is useful to keep the lab open on the weekends and evenings too, because students may not have time during the week to use the lab.

Using the CALL lab with classes is not compulsory for teachers. Teachers who need to use the computers or those who are interested and invested in the use of technology in language instruction use the CALL lab more often.

In all CALL labs except for one of them in Turkey, students can use the CALL lab independently. In one of the Turkish institutions, it is compulsory for students to spend at least two hours a week at the CALL lab.

Maintenance

Maintenance of CALL labs can be guarantied by negotiating maintenance contracts with the computer company which has installed the equipment at the lab. It was observed that all of the CALL labs have one or two years of warranty from the computer company. Otherwise, basic maintenance is usually done by the computer center of the institution. In some institutions, there is a computer technician responsible for the maintenance and repair of the computers.

Selection of Equipment

Budget and goals of the institution as well as needs of the users are among the factors that effect the selection of equipment. In most of the institutions the initial equipment (hardware and software) is chosen by a committee of faculty members who later make their requests to the administration. Subsequent software purchases are selected by teachers according to user needs.

It was observed that there are from 10 to 29 computers in surveyed CALL labs. In all institutions in Turkey , administrators want to provide one computer for each

student in the class. Institutions which do not have enough computers plan to purchase more. International CALL labs have a microcomputer for each student

Plans for the Future

Administrators generally think that they have enough facilities for today but that their CALL labs need some kind of improvement and that change and improvement is inevitable for CALL.

For the future, both national and international interviewees state that they plan to expand the capacity of the existing computers (bigger hard drives, more memory, multimedia capacity) and to open additional CALL labs focusing on one skill e.g. a separate writing lab. Buying more software and developing more materials is also in the planning. The CALL lab facilities are constantly changing. There are always new things to add and better materials to use. For this reason, the CALL labs should be capable of being upgraded, that is it should be possible to add new capacities to them.

There are some points that administrators are not satisfied with and would like to deal with differently if they were to start the setting up process in their labs again. Some of these points are related to the selection of equipment. One of the foreign administrators stated that there have been problems using some of the equipment they have and that they would opt for a different brand if they were to re-purchase. Another foreign administrator stated that at first they started with drill and practice software and developed more flexible materials over time. They would have bought different material from the beginning with the expertise they have now. National CALL labs have difficulty with software because of lack of access to different kinds

of software to review at the initial stages. They would like to be able to choose from a greater variety of software.

Another problem for national administrators was their lack of experience with lab systems. They would like to install a system with a good record of performance. Because of the novelty of CALL labs in Turkey, there is not enough shared local experience with CALL labs. It can be inferred from the above mentioned points that an investigation should be done before setting up a CALL lab. This includes software evaluation and a needs analysis for the students. The hardware should be tested for a certain time before the decision is made. Decision makers should have a variety of hardware and software choices to choose from in order to decide on the most appropriate one.

It was observed from the responses to the rating question on the interview that national and international interviewees hold different attitudes towards design issues of CALL labs. Selection of hardware and software seems to be a greater problem for Turkish administrators than for foreign administrators. Turkish administrators state that they have to contact foreign countries to make orders, and it takes time to receive the material.

From the responses given to the ranking question on the interview it can be seen that when setting up a CALL lab, every institution follows a somewhat different sequence. According to the total ranking suggested by all interviewees' responses, finding adequate budget is the first issue to be considered. When training is concerned, training of students precedes the training of staff and teachers. This response may seem odd since staff and teachers are responsible for training students.

This response in interpreted to mean that training for students is more critical and takes longer than training staff and teachers. Administrators prefer to select the hardware before the software. Other commentators suggest that software selection is critical in CALL, Coburn et. al. (1985) notes that a computer is the software it runs. He also suggests that software be selected according to needs before the hardware to operate that particular software on, is selected. Following software selection the sequence of decisions is scheduling, obtaining appropriate space and location, maintaining facility and establishing links with users follow others in the sequence.

Another research question addressed was how students reacted to the design decisions made at the initial stages of the setting up of their CALL lab. The following student reactions were found from the student questionnaires.

In the first section of the questionnaire, students' general attitude to CALL labs was examined. It was found that all students feel that the CALL facility is very important but that it has not lived up to its potential or their expectations as yet.

The second part of the questionnaire examined students' use of the CALL lab. The results show that the students use the CALL lab both independently and with their class. In one of the institutions, class use of the CALL lab is higher, because teachers take their students to the CALL lab more often. In the other institutions, students sometimes use the e-mail facility in the CALL lab to do their assignments, and this requires that students use the CALL lab independently. The CALL lab in this institution is designed to provide an atmosphere where students can be exposed to the target language by listening to authentic speech samples. The way the lab is designed in an institution effects the way the students use it. If the software and equipment is

more relevant to independent study, then the need for whole class use of the lab is reduced. One other factor which reduces class use of the CALL lab according to the administrators is that sometimes the computers do not work properly and this results in waste of time. For this reason instructors assign often CALL lab work to students instead of taking their class there. In order to use the CALL lab with a whole class there should be enough computers, and the equipment should be checked regularly in order to prevent break downs. A networked CALL lab is more suitable for use with classes and stand alone computers are more suitable for independent use of students. Yet, models have been developed to use stand alone computers with a class and networked equipment for individual use.

In the third part of the questionnaire, students' attitudes towards the design of the CALL lab in their institution were sought. In general, students are happy that there is a CALL facility in their institution but they think that there are some points which need improvement. The main point that students emphasize is modernity of the equipment and software. Regarding equipment, students find the number of computers adequate, but they think that the maintenance of these computers is a problem and that the hardware causes problems frequently. In terms of software, however, most students do not find the CALL lab adequate, they state that the software is not interesting and motivating. All students agree that their CALL lab needs updating and should be more modern in terms of hardware and software. Most of the administrators and CALL lab staff state they have future plans for buying more software and updating their lab equipment. There should be a variety of kinds of software for students to choose from.

In terms of scheduling, students agree that the CALL lab in their institution has been scheduled appropriately.

Although the students enjoy working with computers at the CALL lab, they are not satisfied with the lay out of the CALL lab and think that the CALL lab does not provide a comfortable learning environment for them; this is partly because of the technical problems that occur while studying. The technical problems according to the lab instructors are especially disruptive when they want to use the lab with their students. If there are not enough functioning computers, it is a waste of time to take the students to the lab.

Students think that they have received enough training, lab instructors have also stated that the students learn how to use the programs in the CALL lab easily, and that after an orientation period they can get along without help from the staff. The staff, according to students are trained adequately and are accessible when they are needed. The training of the teachers is also not seen as problem by the students.

In the fourth part of the questionnaire, the students were asked their opinion about future changes for the CALL lab in their institution in terms of training, equipment, e-mail and Internet and staffing issues. Students think that it is important to buy additional equipment and software for the CALL lab and update the existing equipment.

The students also find it important to provide access to e-mail and the Internet from the CALL lab. CALL lab instructors also find it useful to use e-mail for language teaching. They have encouraged their students to subscribe to student discussion lists. They also communicate with their students through the e-mail, and

distribute assignments. Instructors also state that students may misuse e-mail and Internet, e.g., they write in Turkish on e-mail and download games from the Internet. Hiring more staff is not important according to students but that training of staff and teachers is important for the CALL lab. Another important point is to increase the working hours in the CALL lab. Students would also like to work in the CALL lab on the weekend and in the evenings.

It is suggested in the related literature, Paramskas (1993), Smith (1988), that design is not a formulaic activity and that it does not have prescriptive or sequential steps that will ensure success. The process of design could essentially go on forever. But defining what issues are critical at the beginning of the design act sets limits to the problem at hand. In this respect, the main purpose of this study was to define critical design issues involved in the decision making for a CALL lab and to provide samples from decisions made at different institutions about these design issues.

Limitations of the study

The major limitations of the study were the lack of variety in the type of institutions sampled and the inability of the researcher to elicit responses from international administrators contacted via e-mail correspondence. Originally 15 administrators from 10 countries were sent the interview questions through e-mail but only three of these, all from the United States, responded.

The study could have included more student questionnaires from various institutions instead of two, but two of the institutions sampled in Turkey could not provide student subjects to answer questionnaires. In one of the institutions the policy

of the institution prohibited this, in the other the CALL lab was being moved from one building to the other and it was not possible to find students who had enough experience with the CALL lab to answer the questions effectively.

Institutional Implications

This study has investigated the design issues to be considered while setting up a CALL lab in tertiary level institutions and provided decision samples in respect to these design issues from both national and international institutions which are running CALL labs. The results of the study should be of help for decision makers in Karadeniz Technical University in their task of designing a CALL lab for use in the Preparatory School of English for Post Graduate Students. Making a large investment in the CALL lab does not guarantee that it will be effective and highly used. The most important consideration is to assess the needs of users and requirements of the institution and to determine exactly what is needed in the CALL lab and what is not necessary. Research can not state the "best" way of setting up an effective and affordable CALL lab. My own research aims to reflect experience with CALL labs nationally and internationally to set limits to the task of decision makers. The following are the suggestions that the researcher can make in light of the study. The suggestions are addressed to decision makers at KTU and their potential advisory groups.

The students at KTU Preparatory School of English for Post Graduate Students have little opportunity to practice English outside their classroom. Yet these students have to gain a mastery of English in as limited time as one year. A review of related

literature has revealed that the computer, with its expanded capacities, is seen today as an aid which provides opportunity for lifelike language practice. This practice opportunity can be expanded to the four skills of listening, speaking, writing and reading. With multimedia components, the CALL lab also has the capacity of combining a Language Lab, a Video Lab and a Self Access Center. At this point, a computer lab will be the most appropriate facility for both practice and learning purposes for the KTU setting. The following are suggestions which can be made in light of the study. These suggestions are addressed to decisions for setting up a CALL lab in KTU for use in Preparatory School of English for Post Graduate Students.

Setting up a CALL lab is an expensive undertaking, but it pays in time with the benefits it provides. As KTÜ is a public University, the budget for the CALL lab can be supplied from external sources if the University cannot afford such an expense internally. These external sources can either be governmental sources, companies or foundations which would be willing to support a CALL project. After the budget source has been identified, the next issue to be considered is formation of a steering committee which will suggest a program for stating the uses and goals of the CALL lab, choosing software, selecting equipment and providing training for students, staff and teachers. This steering committee should consist of administrators,CALL specialists with university experience as well as teachers who will make use of the facility.

The steering committee needs to oversee a systematic analysis of learner needs and potential instructional uses. Results of the needs analysis will be the principal input to CALL lab design and, in particular, the selection of appropriate software. Software

review remains a major problem in Turkey and the steering committee may want to solicit the help of an impartial international agency to assist in software review and selection. Software selection will direct the choice of hardware to run the software. Questions of equipment reliability, maintenance and likely absolescence are also key issues at this point. Again, an impartial outside agency might be contracted to serve as advisor in the matter of hardware selection.

In the KTU case, students may need software focusing on all four skills and grammar. This kind of software requires computers with multimedia capacity. Another useful capacity would be Internet and e-mail connections, KTU students begin their masters programs after they complete the language course, and they will need to contact Turkish and foreign experts to exchange ideas and to explore information in their field of study. Learning how to use e-mail effectively has also been shown to develop writing and typing skills. All departments in KTU already have e-mail and Internet connections. Thus, this should not be an additional financial burden for the University.

Training students, teachers and staff is a next important issue to be considered. Again, outside experts with experience in CALL will be useful. Trainerrs experienced in CALL can be invited to do workshops with teachers, students and staff. Since training is considered as an ongoing issue, retaining a CALL training specialist will be useful for developing the capacity of KTU staff to use the CALL lab ever more effectively.

Experience of CALL lab in Turkey has shown that problems with maintenance is one of the factors that affect both user and teacher attitudes towards the CALL lab. For day to day maintenance of the CALL lab, a part-time technician can be hired. Otherwise,

help can be taken from the Computer Center of KTU. Success has been reported by those who hire a technician exclusively for the CALL lab.

Finally, student use is the critical "bottom line" issue in CALL lab design and operation. The lab should be designed for both class use and individual use. This means designing the lab with user friendly features. These might include on-demand training, easy software access, simple operational instructions, computer language games, comfortable lighting and seating, evening and weekend operational hours and opportunities for collaborative work and local networking (LAN).

Implications for Further Research

In the literature reviewed, the gaps in the literature related to studies on CALL labs in Turkey and elsewhere were discussed. Based on the study, the implications that can be made for further research include the following;

Future Turkish studies on CALL might focus on the pedagogical aspect of CALL rather than the technical, programming aspect. This study examined general attitudes of the students towards the CALL lab in relation to the critical design issues involved in the setting up of a CALL lab. Further study might address attitudes of students with different learning styles towards the CALL lab.

The student questionnaire suggested that although students find the CALL lab necessary, they do not use the CALL lab facility very often. Research could be done in order to examine the reasons why students do not use the lab very often.

According to the results of the interviews, it was observed that the CALL lab was not part of the curriculum, but that teachers decided to take their students to the

lab if they found it necessary. Ways of integrating CALL into the curriculum may be sought by further studies.

Training seems to be one of the key elements for the effective use of a CALL lab. It was observed from the interviews that there were not regular training programs for teachers, staff and students. It is not clear how an optimal training program should be designed- how much attention should be deviated to technical concerns such as operation, maintenance, troubleshooting; how much to student counseling; how much to curriculum integration; how much to materials preparation and software authoring. Training design need to be reviewed and evaluated.

Finally, it was observed from the interviews that an underlying philosophy of using the CALL lab in language teaching was not clear to administrators and CALL lab staff. Such philosophical inquiries are rare in the CALL literature too. Further research could focus on the philosophy and pedagogical value of CALL.

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APPENDICES

APPENDIX A INTERVIEW QUESTIONS

1. Who were the decision makers for the CALL lab in your institution ?
2. How were these decision makers determined ?
3. What skill areas or uses was the CALL lab intended for ?
4. How were these decided?
5. How was the budget supplied for the setting up of the CALL lab ?
6. Who is in charge of the budget?
7. What was the approximate budget for the setting up of the CALL lab?
8. What is the current yearly budget for maintenance and software?
9. Are there any external sources of funding?
10. How many staff are responsible only for the CALL lab?
11. What are their responsibilities?
12. Do the staff go through any kind of training before working in the lab?
13. What is this training?
14. What is the working hours of the CALL lab?
15. Do all the instructors use the CALL lab with their classes?
16. Do the instructors go through any kind of training before working in the CALL lab?
17. What kind of training?

18. How many hours a week is the CALL lab used by instructors with their classes?
19. What proportion are these hours of their overall time in the class?
20. Do the students use the lab independently?
21. Do the students go through any kind of training to use the lab independently? What kind of training?
22. For how many hours is the lab open for individual use of students?
23. Is the time adequate for student requests for usage?
24. What skill areas or is the lab used currently?
25. Who is currently responsible for the maintenance of the lab?
26. How was the hardware for the lab selected?
27. How was the software for the lab selected?
28. How many computers are there at the lab?
29. Are there adequate facilities for student needs?
30. Are the computers networked or on a stand-alone basis?
31. What kind of future changes are you planning for the CALL lab?
32. Are there any points that you would have dealt with differently if you were to start the setting up process again?
33. Rate the following design issues from 1:most problematic to 5: least problematic to handle in the initial stages of setting up your CALL lab.

choosing staff

training staff

training students

training teachers

scheduling for use

finding adequate budget

selecting hardware

selecting software

establishing links with users

maintaining facility

obtaining appropriate space and location

34. Can you suggest an ideal sequence for the above activities? Please rank from first to the last.

choosing staff

training staff

training students

training teachers

scheduling for use

finding adequate budget

selecting hardware

selecting software

establishing links with users

maintaining facility

obtaining appropriate space and location

APPENDIX B STUDENT QUESTIONNAIRE

Dear Students

The following questionnaire includes questions about the existing CALL lab in your institution. The questions focus on the design issues of the CALL lab such as scheduling' staffing and equipment. The manes of the participants will be kept anonymous. Your participation will provide valuable data for the study. Thanks in advance for your cooperation.

LANGUAGE LEVEL_____ SEX: Male

DEPARTMENT _____ Female

A. Circle the option that applies to you:

1. How necessary is it according to you to have a CALL lab in a language teaching institution?

a. very necessary b. necessary c. do not care

d. not so necessary e. not at all necessary

2. How effective has the CALL lab been on your learning a foreign language?

a. very effective b. effective c. Neutral

b. not so effective e. not at all efffective

3. For which skill areas do you use the CALL lab most frequently?

    a. reading

    b. writing

    c. listening

    d. speaking

4. How do you use the CALL lab?

    a. independently

    b. with my class

    c. both

5. How many hours a week do you use the CALL lab with your class? Circle the option that applies to you.

    a. 0-1 hour b. 2-4 hours

    c. 5-7 hours d. more than 7 hours

6. How many hours a week do you use the CALL lab independently? Circle the option that applies to you?

    a. 0-1 hour b. 2-4 hours

    b. 5-7 hours d. more than 7 hours

7. What do you use the CALL lab for when you use it independently?

a. to practice a language point ☐ very often ☐ often ☐ sometimes ☐ rarely ☐ never

b. to get ready for an exam ☐ very often ☐ often ☐ sometimes ☐ rarely ☐ never

c. to develop my vocabulary ☐ very often ☐ often ☐ sometimes ☐ rarely ☐ never

d. for enjoyment ☐ very often ☐ often ☐ sometimes ☐ rarely ☐ never

e. to pass time ☐ very often ☐ often ☐ sometimes ☐ rarely ☐ never

B. 1. Write at least one thing but no more than three things you like best about the CALL lab?

1. _____

_____

2. _____

_____

3. _____

_____

2. Write at least one thing but no more than three things you like least about the CALL lab?

1. _____

_____

2. _____

_____

3. _____

_____

C. Circle the option that applies to you.

	strongly agree	*agree*	*no opinion*	*disagree*	*strongly disagree*
1. Our CALL lab is scheduled appropriately.	1	2	3	4	5
2. There are enough computers at the CALL lab.	1	2	3	4	5
3. The computers at the CALL lab are modern enough.	1	2	3	4	5
4. The software at the CALL lab is satisfactory	1	2	3	4	5
5. The software is interesting and motivating	1	2	3	4	5
6. The lay out of the CALL lab provides a comfortable learning environment	1	2	3	4	5
7. I enjoy studying at the CALL lab	1	2	3	4	5
8. The CALL lab staff is available when they are needed	1	2	3	4	5
9. The CALL lab staff is adequately trained to use the CALL lab and provide guidance	1	2	3	4	5
10. The teachers are adequately trained to use the CALL lab and provide guidance	1	2	3	4	5
11. As a student I am adequately trained to use the CALL lab independently	1	2	3	4	5
12. The computers break down very often	1	2	3	4	5
14. The maintenance of the CALL lab is a problem	1	2	3	4	5

D. If you were an administrator and wanted to make changes in your CALL lab, which one or ones of the following would you consider? Put the appropriate number next to each item according to the degree of importance. (0: not important, 1: of minor importance, 2: important, 3: very important)

a. _____buying more computers

b. _____expanding the capacity of existing computers

c. _____providing multimedia capacity for the computers

d. _____buying more software

e. _____connecting the lab to the World Wide Web

f. _____using e-mail as a means of instruction

g. _____hiring more staff

h. _____training staff and teachers more effectively

i. _____training students more efficiently

j. _____increasing the working time in the lab

APPENDIX C STUDENT QUESTIONNAIRE TURKISH VERSION

Sevgili Öğrenciler

Aşağıdaki anket, okulunuzda bulunan Bilgisayar Destekli Dil Eğitimi Laboratuarı hakkında sorular içermektedir. Ankete cevap veren kişilerin isimleri gizli tutulacaktır. Ankete katılımınız tez çalışmasına değerli katkıda bulunacaktır. Katkılarınız için şimdiden teşekkürler.

DİL SEVİYESİ _____ CİNSİYET : KIZ

BÖLÜM _____ ERKEK

A. Aşağıdaki seçeneklerden size uygun olanı işaretleyiniz.

1. Sizce yabancı dil eğitimi yapan bir eğitim kurumunun Bilgisayar Destekli Dil Laboratuarına sahip olması ne kadar gereklidir?

a. çok gerekli b. gerekli c. ilgilenmiyorum

b. d. Çok gerekli değil e. hiç gerekli değil

2. Dil öğrenmenizde Bilgisayar Destekli Dil Laboratuarının ne kadar etkisi oldu?

a. çok etkili b. etkili c. tarafsız

b. çok etkili değil e. hiç etkili değil

7. Bilgisayar Destekli Dil Laboratuarını bağımsız olarak kullandığınızda daha çok hangi amaçla kullanıyorsunuz? Her seçenek için uygun kullanımı işaretleyiniz.

a. bir dil konusunu pratik etmek için ☐her zaman ☐çoğu zaman ☐bazen ☐nadiren ☐hiç

b. sınava hazırlanmak için ☐her zaman ☐çoğu zaman ☐bazen ☐nadiren ☐hiç

c. kelime bilgimi geliştirmek için ☐her zaman ☐çoğu zaman ☐bazen ☐nadiren ☐hiç

d. eğlence için ☐her zaman ☐çoğu zaman ☐bazen ☐nadiren ☐hiç

e. zaman geçirmek için ☐her zaman ☐çoğu zaman ☐bazen ☐nadiren ☐hiç

B. 1. Laboratuarın <u>en çok sevdiğiniz</u> en az bir, en fazla üç yönünü yazınız.

1. _____

_____

2. _____

_____

3. _____

_____

2. Laboratuarın <u>en az sevdiğiniz</u> en az bir, en fazla üç yönünü yazınız.

1. _____

_____

2. _____

_____

3. _____

_____

C. Aşağıdaki seçenekleri kendi görüşünüze uygun olarak işaretleyiniz.

	TK	*K*	*B*	*Km*	*KK*
1. Laboratuarımızın programı bizim çalışmamıza uygun olarak düzenlenmiş.	1	2	3	4	5
2. Laboratuarımızda yeteri sayıda bilgisayar var.	1	2	3	4	5
3.. Laboratuardaki programlar yeterli.	1	2	3	4	5
4. Laboratuardaki programlar ilgi çekici.	1	2	3	4	5
5. Laboratuarın fiziki düzenlemesi rahat bir çalışma ortamı sağlıyor.	1	2	3	4	5
6. Laboratuarda çalışmanın zevkli olduğunu düşünüyorum	1	2	3	4	5
7. Laboratuar görevlilerine ihtiyacım olduğu zaman ulaşabiliyorum.	1	2	3	4	5
8. Görevlilerin eğitimi laboratuarı kullanmak ve öğrencilere rehberlik yapmak için yeterlidir.	1	2	3	4	5
9. Hocaların eğitimi laboratuarı kullanmak ve öğrencilere rehberlik yapmak için yeterlidir.	1	2	3	4	5
10. Bir öğrenci olarak laboratuarda bağımsız çalışacak kadar eğitim aldım.	1	2	3	4	5
11. laboratuardaki bilgisayarlar çok çabuk bozuluyor.	1	2	3	4	5
12. Laboratuarın bakımı sorun yaratıyor.	1	2	3	4	5
13. laboratuarın yenilenmeye ihtiyacı var.	1	2	3	4	5

D Eğer yetki sahibi olsaydınız ve laboratuarda bazı değişiklikler yapmak isteseydiniz aşağıdakilerden hangilerini düşünürdünüz? Taşıdığı öneme göre her maddenin yanına uygun bir rakam yazınız. (0: önemsiz, 1:ikincil derecede önemli, 2: önemli, 3:çok önemli)

a. _____ daha fazla bilgisayar satın almak

b. _____ varolan bilgisayarların kapasitesini arttırmak

c. _____ bilgisayarlara multimedia kapasitesi eklemek

d. _____ daha fazla program satın almak

e. _____ laboratuarı Internet'e bağlamak

f. _____ e-mail' i ders aracı olarak kullanmak

g. _____ daha fazla görevli çalıştırmak

h. _____ laboratuar görevlilerini ve hocaları laboratuarın kullanımı konusunda daha etkin bir biçimde eğitmek

i. _____ öğrencileri laboratuarın kullanımı konusunda daha etkin bir biçimde eğitmek

j. _____ laboratuarda çalışma saatlerini arttırmak

APPENDIX D LIST OF FOREIGN INSTITUTIONS CONTACTED

The following is a list of List of CALL experts in international institutions contacted through the e-mail. These institutions and experts were chosen from CALICO resource guide, 1996.

California State University, USA (Rika Yoshii)

CITL College International, France (Robin Bodkin)

Concordia University, Canada (Roger Kenner)

Hope College, Holland (Hupert P. Weller)

Michigan State University, USA (Claire Bradin,)

Monash University, Australia (Jack L. Burston)

Oregon State University, USA (Deborah Healey)

Sultan Qabos University, Oman (Vance Stevens)

Tel Aviv University, Israel(Miriam Scholnik)

University of Albany, USA (Carla Meskill)

University of Antwerp, Belgium (Wilfried Decoo)

University of Hawaii at Manoa Honolulu (Gerald K.J. Chang)

University of Turin, Italy (Michelangelo Conoscenti)

University of Western Ontario, Canada (Alan Bailin)